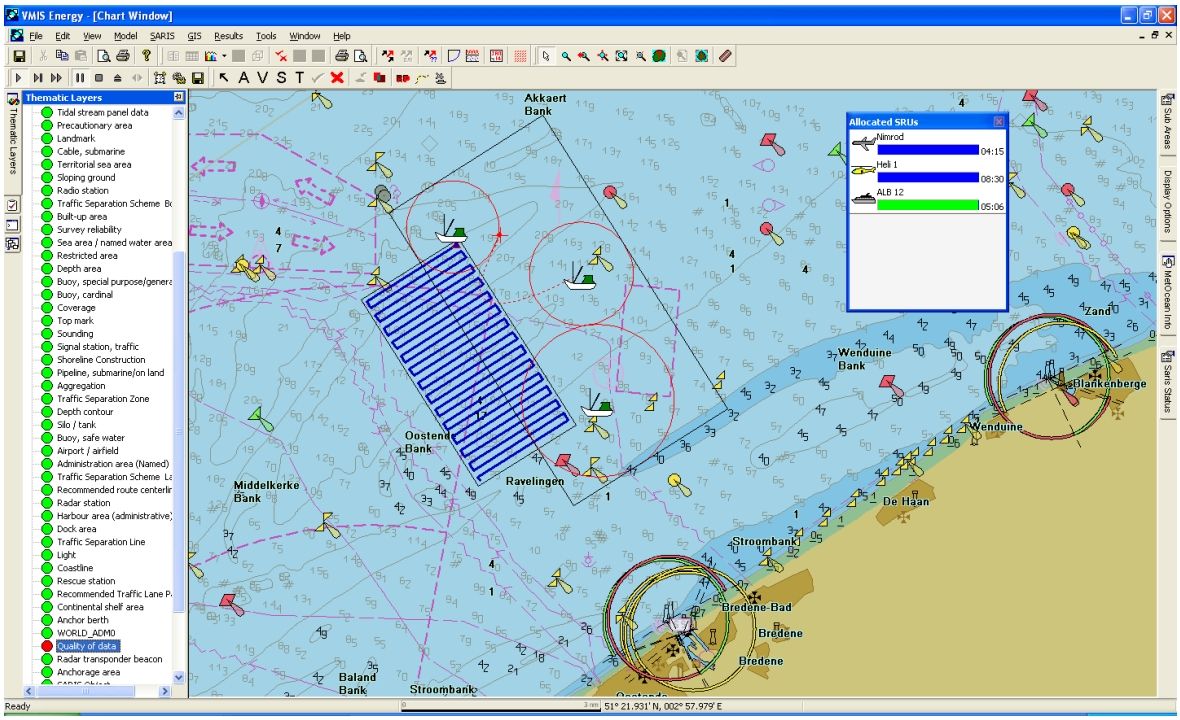
SEARCH AND RESCUE INFORMATION SYSTEM (SARIS)



TECHNICAL TRAINING
User Manual
SARIS v3.6

This Manual has been prepared by:-

Maritime and Coastguard Agency

and

BMT ARGOSS

TABLE OF CONTENTS

1. SYSTEM REQUIREMENTS 4

2. SARIS CONFIGURATION 4

2.1 UNITS 4

2.2 METOCEAN 5

2.3 FILES 5

2.4 SARIS 7

3. CONFIGURING SARIS MODEL RUNS 9

3.1 MODEL RUN MANAGER 9

3.2 CONFIGURING MODEL RUNS IN SARIS v3.x 10

3.3 CONFIGURING A DATUM POINT MODEL RUN 11

3.3.1 Step 1 of 5: Plan Details 11

3.3.2 Step 2 of 5: Datum Point 12

3.3.3 Step 3 of 5: Weather Set-up 13

3.3.4 Step 4 of 5: Leeway Input 15

3.3.5 Step 5 of 5: Errors Input 16

3.4 CONFIGURING A DATUM LINE MODEL RUN 18

3.4.1 Step 1 of 5: Plan Details 18

3.4.2 Step 2 of 5: Datum Line 18

3.4.3 Step 3 of 5: Weather Set-up 20

3.4.4 Step 4 of 5: Leeway Input 21

3.4.5 Step 5 of 5: Errors Input 21

3.5 CONFIGURING A BACKTRACK MODEL RUN 22

3.5.1 Step 1 of 5: Plan Details 22

3.5.2 Step 2 of 5: Backtrack 22

3.5.3 Step 3 of 5: Weather Set-up 23

3.5.4 Step 4 of 5: Leeway Input 23

3.5.5 Step 5 of 5: Errors Input 24

3.6 CONFIGURING A RAPID RESPONSE MODEL 25

3.7 CONFIGURING A SAC ONLY MODEL RUN 25

3.7.1 Step 1 of 3: Plan Details 25

3.7.2 Step 2 of 3: Search Area Details 26

3.7.3 Step 3 of 3: SAC Details 27

4. RUNNING A SAD MODEL 30

4.1 MODEL CONTROL BUTTONS 30

4.2 SEARCH AREA STATUS PANE 31

4.3 EXTEND DATUM TIME 31

4.4 SAD MODEL DISPLAY OPTIONS 32

4.5 REPORTS – SAD MODEL RUNS 33

4.6 PROCEEDING TO SAC MODEL FOLLOWING A SAD MODEL RUN 34

4.6.1 Step 1 of 2: Search Area Details 35
5. RUNNING A SAC MODEL 36
5.1 DEPLOYING AN SRU TO THE SEARCH AREA 36
5.2 NOTES ON THE DEFAULT SUB AREA DISPLAY 37
5.3 MANIPULATING SUB-AREAS 38
5.3.1 Sub area status Panel 40
5.3.2 Calculating Cumulative Probability 42
5.4 REPORTS – SAC MODEL RUNS 43
6. EDITING AND LOADING PREVIOUS MODEL RUNS 44
7. ROUTE PLANNING TOOL 45
7.1 CONFIGURING ROUTE PLANS 45
7.2 CONFIGURING VESSELS OR AIRCRAFT 46
7.3 USING THE QUERY ROUTE PLAN TOOL 47
8. APPENDIX 1: DATE/TIME AND COLOUR SELECTION 49
8.1 Date and Time Selection using the Calendar / Clock Dialogue box 49
8.2 Selecting Colours via the standard Windows Colour Palette 49
9. APPENDIX 2: IMPORTING AND EXPORTING WEATHER DATA 51

1. SYSTEM REQUIREMENTS

The minimum system requirements for running SARIS are:-

- Pentium processor P4 1.7GHz
- 2Gb RAM
- 100 Mb free hard disk space
- Hi-resolution VGA monitor (1024 x 768)
- CD-ROM
- Floppy Disk (for archiving)
- Microsoft® Windows 2000 and XP.

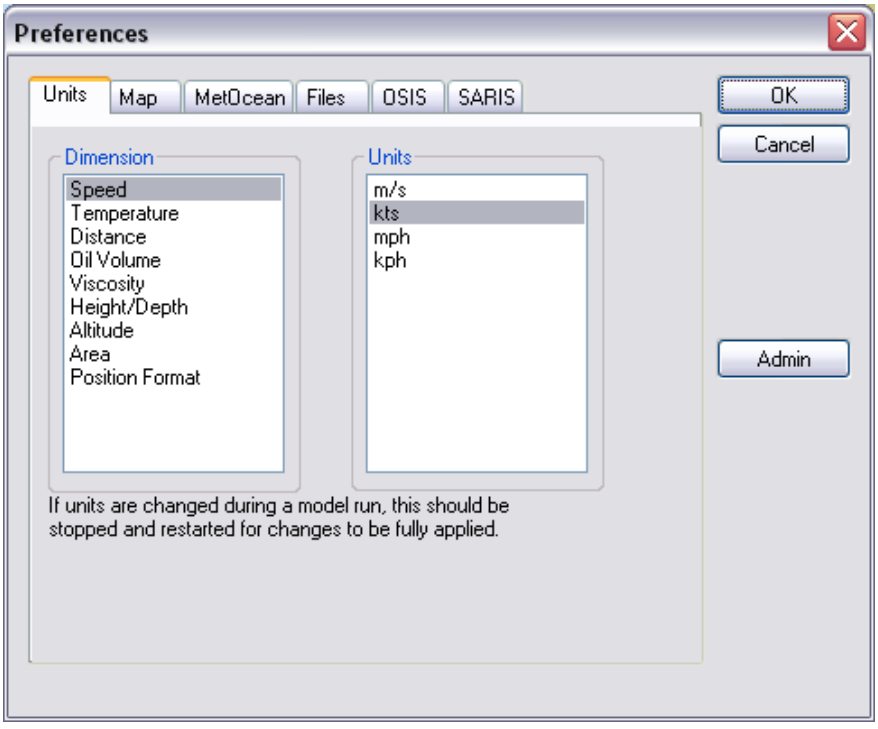
2. SARIS CONFIGURATION

SARIS v3.6 can be configured with many fine resolution tides and currents (hydrodynamics or metocean forecast) databases and corresponding charts depending on the user's requirements. The default settings used in SARIS can be configured under the main menu using **Tools → Preferences.**

For more information about how to configure the charts, GIS views and current and wind databases in SARIS and how to import metocean data, if available, please read the **VMIS ENERGY User Manual**. A full description of the **Tools → Preferences** function is also provided in the **VMIS ENERGY User Manual**.

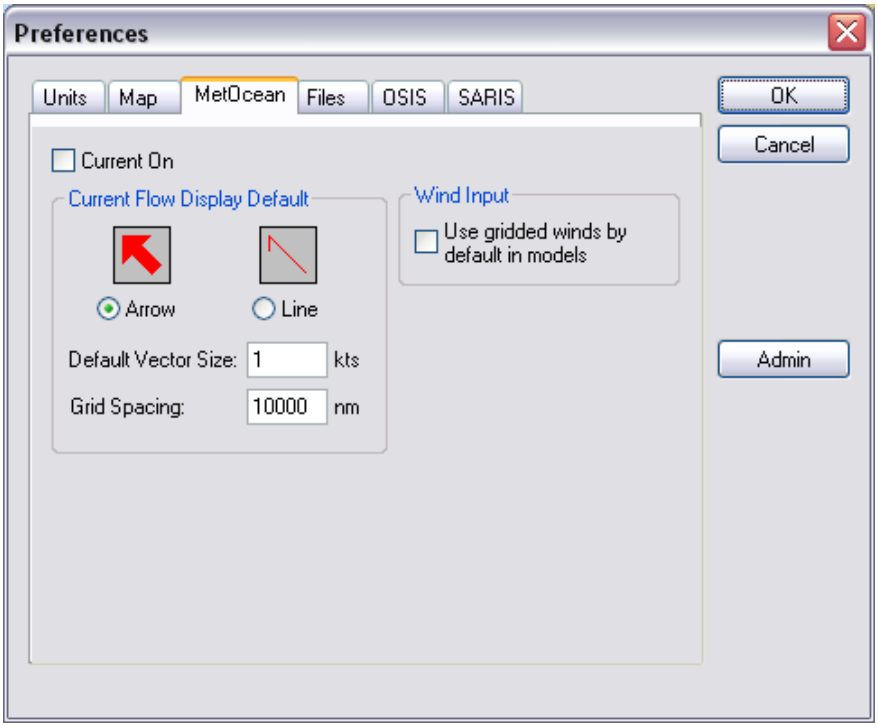
The default settings used in SARIS can be configured as follows:

2.1 UNITS



The **Units** tab sheet enables the units for each **Dimension** used within the modelling applications to be defined. The dimensions that can be edited are listed in the left-hand box, and the associated available **Units** of the highlighted dimension are listed in the right-hand box. The highlighted units are the default for the highlighted dimension – select a new set of units by highlighting another.

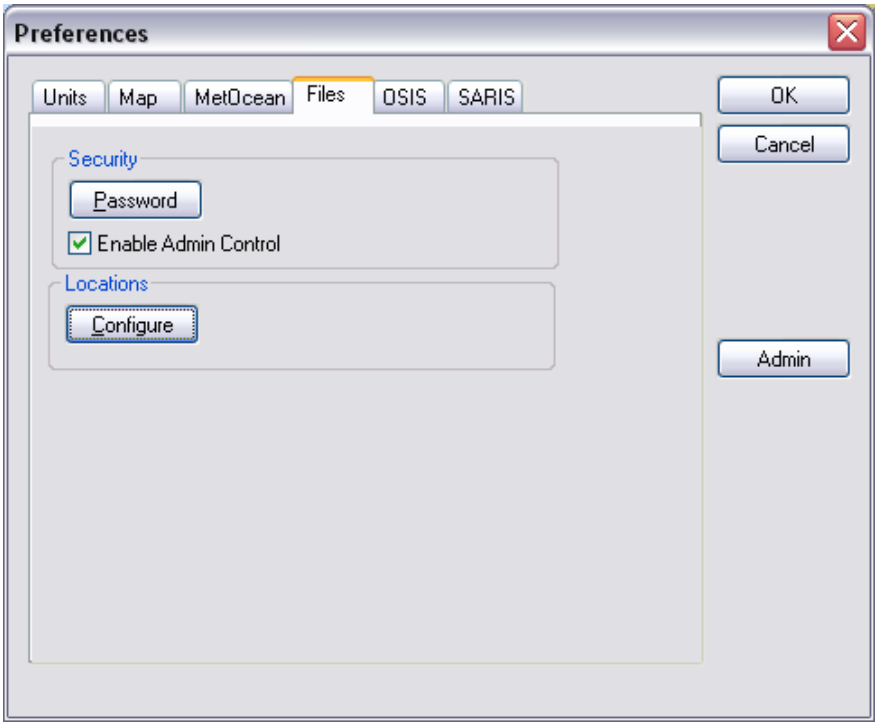
2.2 METOCEAN



The **Metocean** tab allows the basic default current display configuration to be defined and also allows the default wind data selection to be set to use gridded wind databases (checked) or manually entered input data (unchecked) when setting up SARIS models. The wind data selection can be changed by the user during the model setup process as required (see later sections on setting up models), but it allows the user to select whether by **default** this option is checked or unchecked.

2.3 FILES

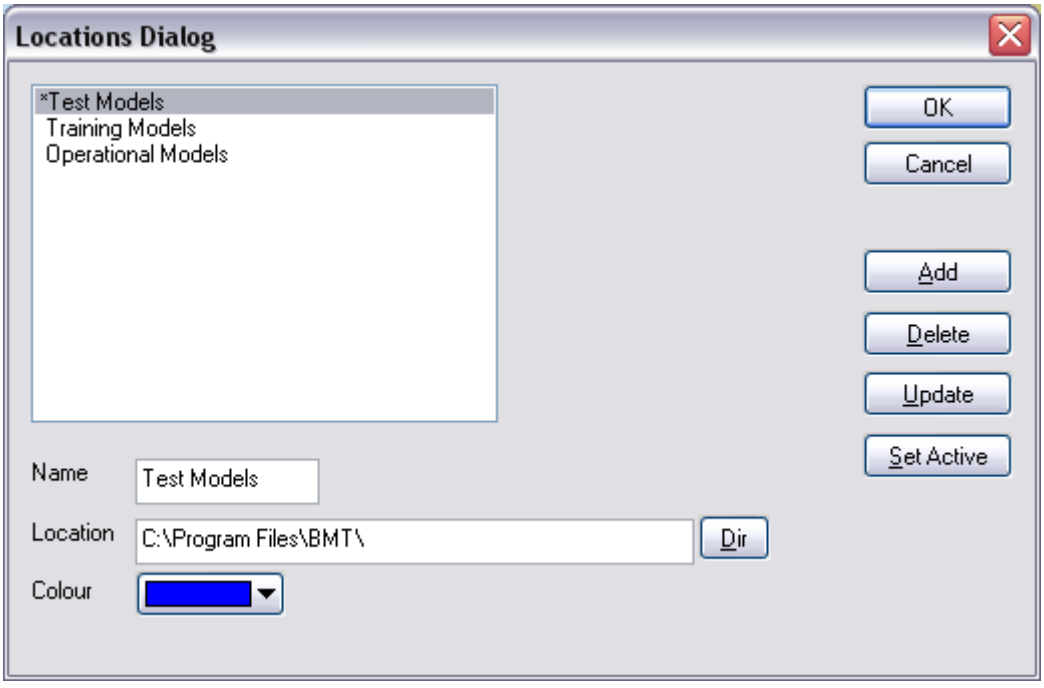
The **Files** tab enables the security settings and locations for saving SARIS model runs to be configured.



Under *Security* the **Password** and **Enable Admin Control** functions provide database, and other critical user functionality, security by allowing only authorised users to access them.

The *Locations* function allows the directory where model runs will be saved to be defined, and password protected if required. The default directory is /UserData.

To change the user directory and name, click **Configure**. This will generate a Locations dialogue box.

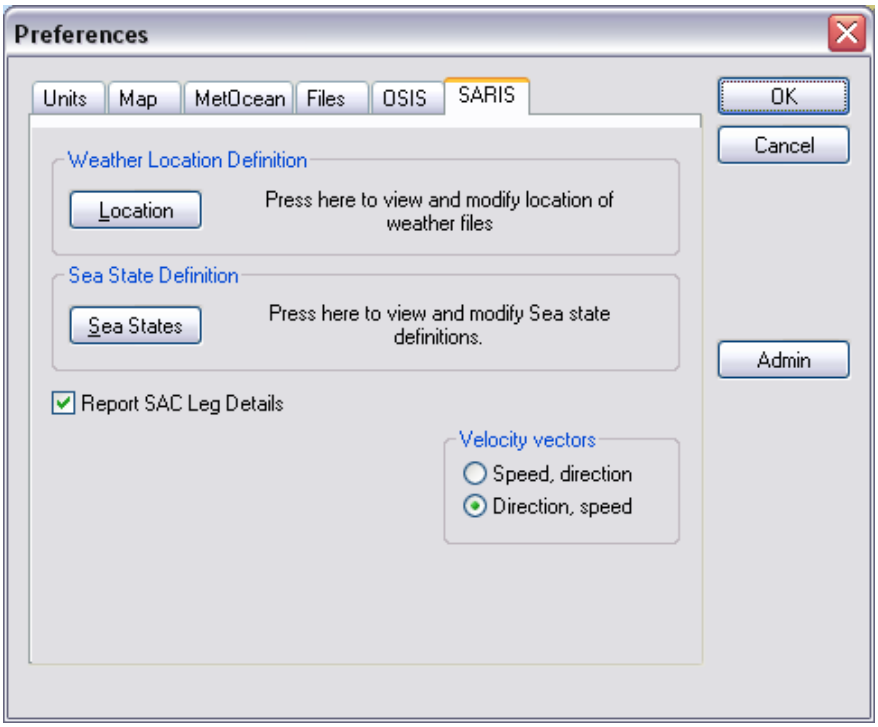


To set up a new location click **Add**. Edit the Location using the **Dir** button, which will bring up a browser window. Browse to the required directory and click **OK.** Give the location a **Name** and choose a text **Colour** (the colour will change the colour of the file name text in the *Model Run Manager* dialogue). Use the **Update** button to apply these changes. Click **Set Active** to set the newly defined location as the default. When active, an asterisk will appear next to the location name, and this location will default to the top of the drop down menu list in the *Model Run Manager* dialogue. You can define as many locations as you require.

Locations previously setup can be removed by selecting the **Delete** button. If no locations are defined the model run files will be stored in the UserData folder by default.

*(Note – only the saved models which are stored in the active directory will be displayed in the Model Manager)***.**

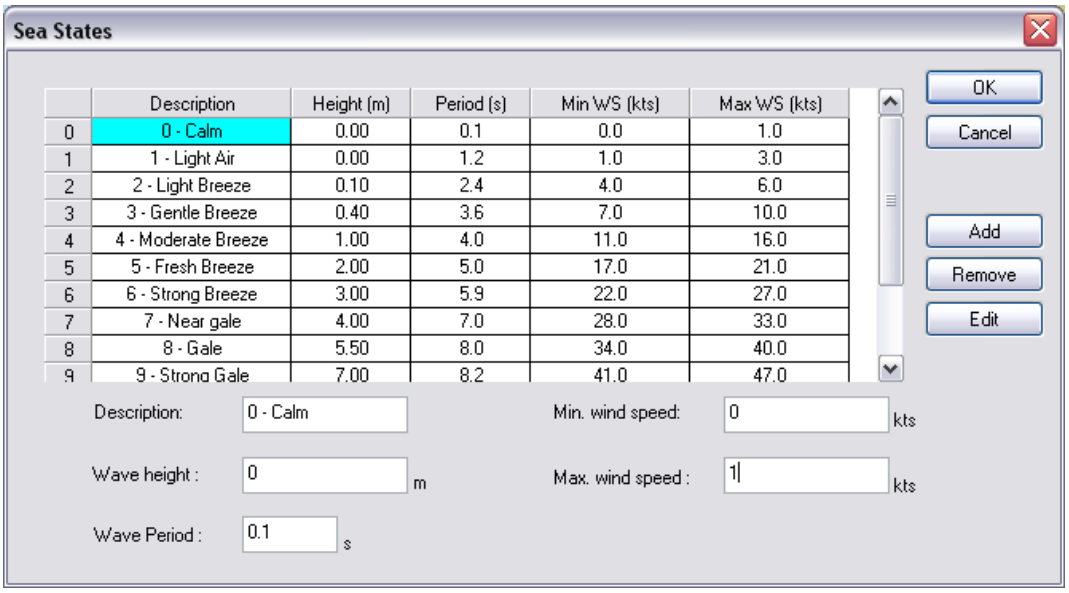
2.4 SARIS



The **SARIS** tab enables the following settings to be configured:

The *Weather Location Definition* is an optional feature for the import of metocean data files which can be supplied by a meteorological office or oceanographic research establishment. If using a fixed hydrodynamic database this will not be used since the hydrodynamics are implemented as an integral part of the SARIS system.

To view or modify the *Sea State Definition*, click the **Sea States** button (modification of this database may require the Administrator password). This will display the *Sea State Definitions* spreadsheet, detailing each sea state category and the associated weather conditions.


Sea States
Description
Height (m)
Period (s)
Min WS (kts)
Max WS (kts)
0 0 - Calm 0.00 0.1 0.0 1.0
1 1 - Light Air 0.00 1.2 1.0 3.0
2 2 - Light Breeze 0.10 2.4 4.0 6.0
3 3 - Gentle Breeze 0.40 3.6 7.0 10.0
4 4 - Moderate Breeze 1.00 4.0 11.0 16.0
5 5 - Fresh Breeze 2.00 5.0 17.0 21.0
6 6 - Strong Breeze 3.00 5.9 22.0 27.0
7 7 - Near gale 4.00 7.0 28.0 33.0
8 8 - Gale 5.50 8.0 34.0 40.0
9 9 - Strong Gale 7.00 8.2 41.0 47.0
OK
Cancel
Add
Remove
Edit
Description: 0 - Calm
Min. wind speed: 0 kts
Wave height : 0 m
Max. wind speed : 1 kts
Wave Period : 0.1 s

The values may be edited by clicking on the required category and then entering the new values in the corresponding fields below the table. Note that the values for wind speed need to be entered in knots. To update the spreadsheet after the alterations have been made, click on the **Edit** button.

To add or delete a whole category, highlight the required category and click the **Add** or **Remove** buttons. New categories are added to the bottom of the list and will have the same values as the highlighted category. Note that there is no warning when deleting categories from this table.

(Caution – please note that altering the Sea States table alters parameters used by the SARIS Model and may affect the results it produces).

If the *Report SAC Leg Details* box is checked then the SARIS Report (see Section 5.2) will include the details of each leg of the search pattern. If this box is not checked then the details of each leg of the search pattern will not be included in the Report.

The *Velocity Vectors* radio buttons allows the user to select the order in which columns of speed and direction of metocean data are displayed in SARIS (for example, the Weather Setup page of a SAD model or the Override Currents setup).

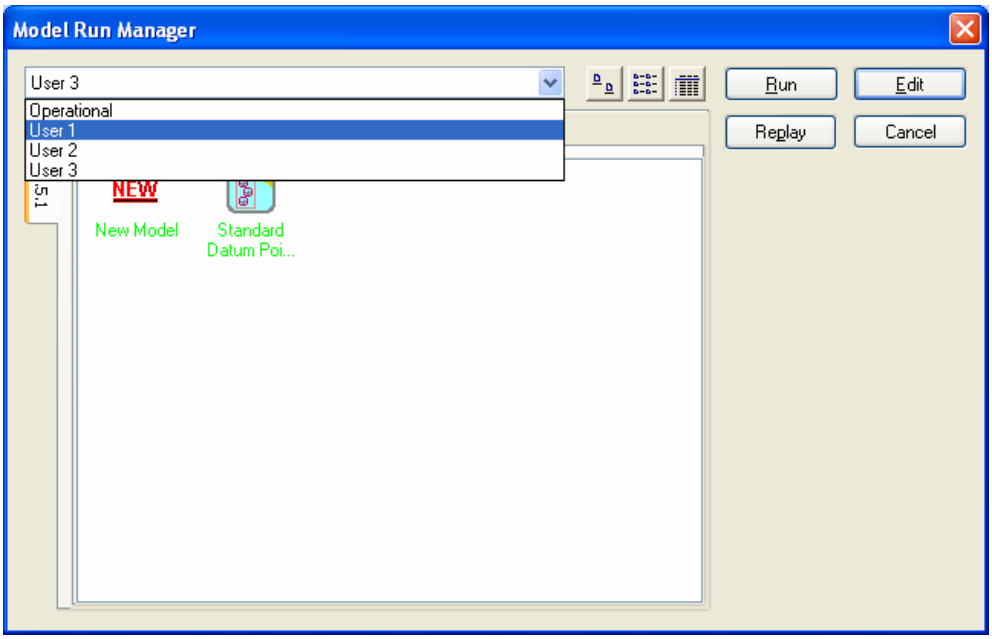
3. CONFIGURING SARIS MODEL RUNS

3.1 MODEL RUN MANAGER

The *Model Run Manager* can be opened in five ways:

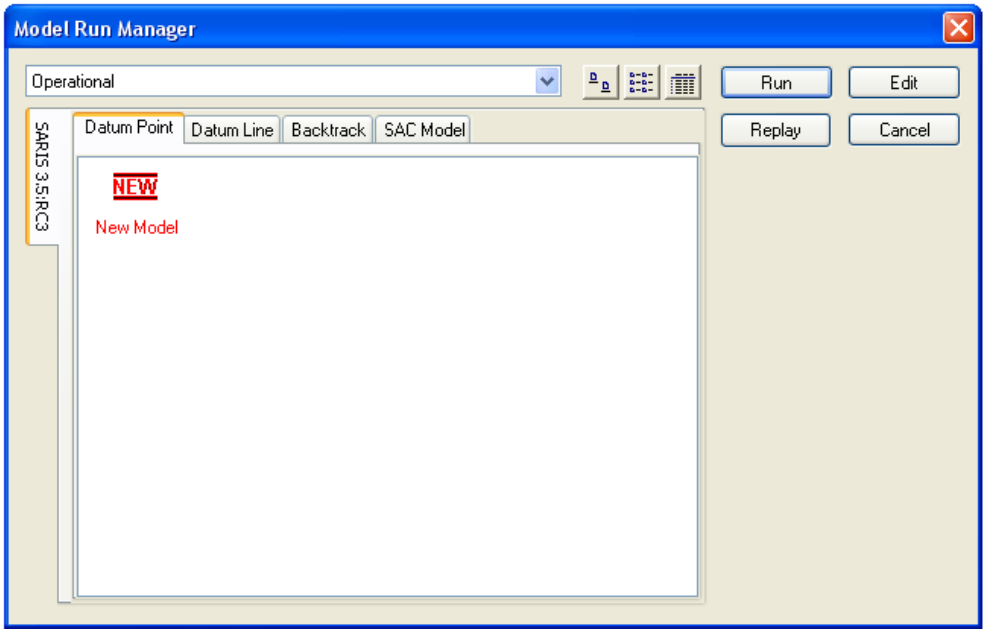
- by selecting **Model → Model Manager**.
- by clicking the Model Manager toolbar button
- via the status panes **Context Menu → Model → Model Manager**
- via the *Chart Window* **Context Menu → SARIS → Incident Location, Incident Locations (Datum Line), or Draw Search Area (SAC)**. A ToolTip will indicate the geographical co-ordinates of the mouse pointer to help establish the incident location(s). Select the required location for the drift start position(s) or search area and click to initiate the *Model Run Manager* dialogue box.
- via the Chart Window **Context Menu → GIS → Measure.** Now lay off the bearing and distance of the incident location from a known fixed point such as a buoy or headland, and without cancelling the measure function, **Context Menu → SARIS → Incident Location.** (This latter option can only be used to select one location and is therefore only valid for the Datum Point and Backtrack models).

If the file location has been updated (as described in section 2.1), the **Model Run Manager** dialogue box will have an additional drop down menu indicating the location where models will be saved. Note that the text colour of the model names is as set up in /Tools/Preferences.



The standard SARIS application supports five model types:

- Datum Point Model
- Rapid Response Model
- Datum Line Model
- Backtrack Model
- Search Area Coverage (SAC) Model Only



The *Model Run Manage*r dialogue has a tab sheet for four of the above model types. The fifth, Rapid Response can be implemented by activating the Datum Point model and modifying your input data values accordingly. On each tab dialogue, icons indicating previously configured and saved runs of each model type will be shown in the main box, for the file location selected. (If none are configured only the "New Model" icon will be displayed).

The icon display can be altered using the display style buttons in the top centre of the box:

Large icons

List display

Detailed List display – includes date/time of model configuration

3.2 CONFIGURING MODEL RUNS IN SARIS V3.X

SARIS v3.x allows the user to configure the following SAR plans:-

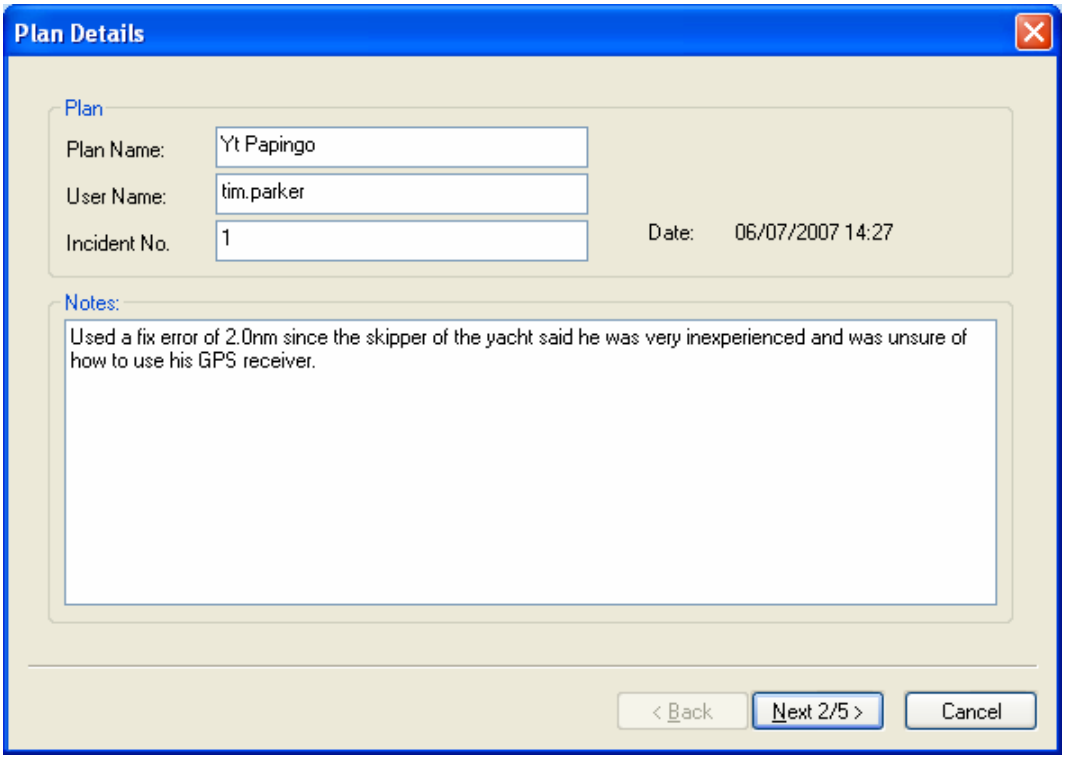
- SAD model runs only
- SAC model runs only
- Integrated SAD & SAC model runs

This manual explains how to set-up the various SAD model types only, how to set-up a SAC model only and finally how to set-up an integrated model run.

3.3 CONFIGURING A DATUM POINT MODEL RUN

To set-up a new Datum Point model, select the **Datum Point** tab sheet in the *Model Run Manager* dialogue box. Double-click the **New Model** icon, or highlight it and click **Edit**. The first of five dialogue boxes will be displayed (Plan Details).

3.3.1 Step 1 of 5: Plan Details



Enter the **Plan Name** - this gives the unique model reference name. The default name is 'Standard Datum Point Model', which can be overwritten. If successive model runs for the same incident are required it is useful to simply suffix the original name with a letter or numeral indicating the same incident but a new model e.g. Yt Papingo A, or Yt Papingo 2, Yt Papingo 3 etc.

User Name allows the name of the model operator to be entered for future reference. The default name is taken from the windows user login name.

The **Incident Number** allows the user to specify a unique number to the model plan. It is a mandatory field, and can be repeated for successive model runs for the same incident.

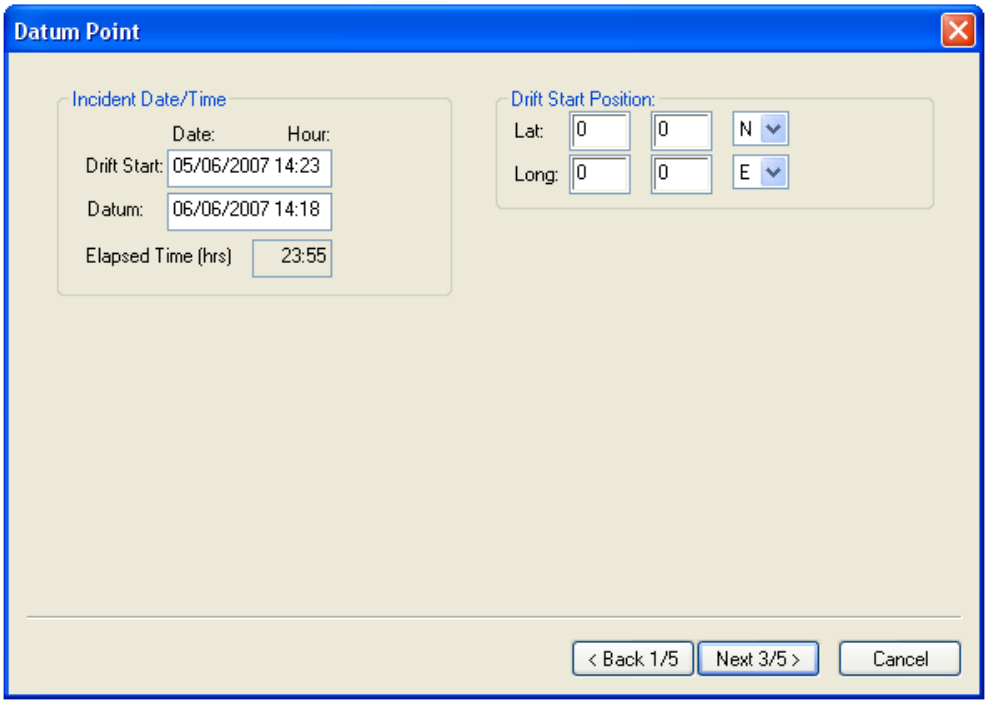
The **Date** indicates the time and date of model configuration and will take the computer clock time when the **New Model** icon is activated. Note that this is NOT the drift start time of the model.

The **Notes** field allows any other information pertaining to the model to be entered. It has word wrap implemented and is often used by operators to record decisions they have made relating to data input values for that specific model run.

Click **Next 2/5** to move to the next stage of model configuration (Datum Point).

(Note – the system will prevent moving to the next stage if a valid Incident Number is not entered)

3.3.2 Step 2 of 5: Datum Point



Under the **Incident Date/Time section:**

The **Drift Start** indicates the drift start date and time and will default to the computer clock time. Double-clicking on the Date field will generate a calendar/clock dialogue box, allowing the date and time to be selected graphically. Another option allows this field to be over-typed by clicking in front of the date or time fields.

The **Datum** indicates the datum date and time and will default to the computer clock time. The user may overtype the datum date and time or double-clicking on the Date field will generate a calendar/clock dialogue box, allowing the date and time to be selected graphically. Again, another option allows this input to be over typed by first clicking in front of the date or time fields.

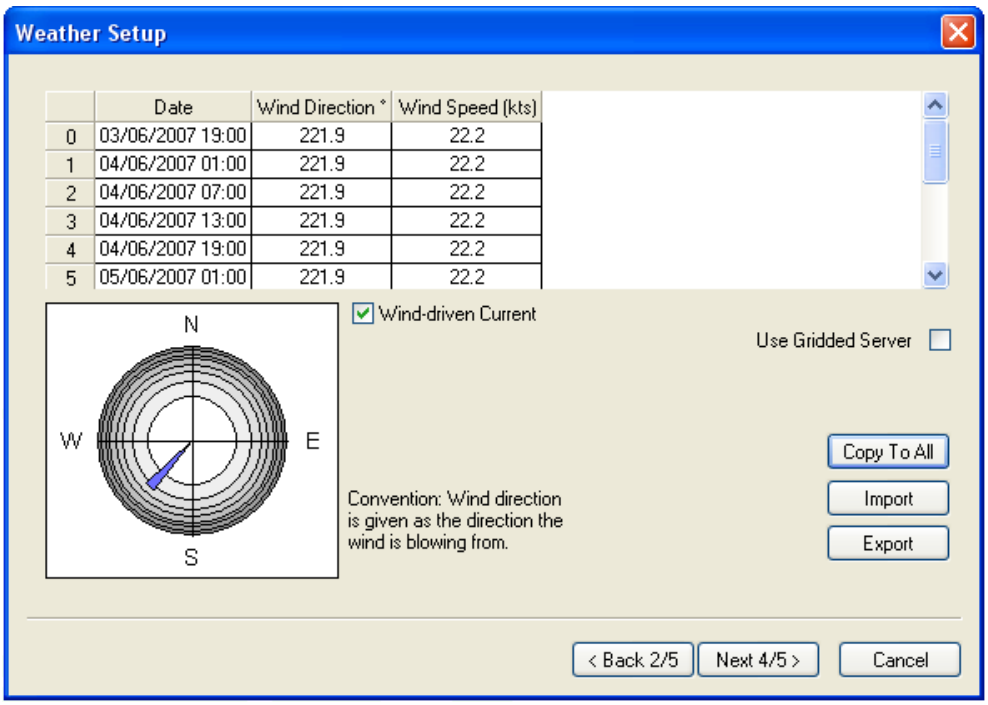
The **Drift Start Position** refers to the position the target was last seen or known to have starting drifting from. If the model was started by specifying the incident location on the chart, that position will be displayed in the dialogue box. If not, the position will be shown as zeros. The Drift Start Position may be manually over typed by clicking in front of the degrees or minutes fields. The north (N), south (S), east (E) or west (W) suffix indicators can be selected by clicking the down arrow or by entering the field and typing the appropriate letter, N, S, E, or W.

You can also navigate between fields in this dialogue easily by using the tab key.

Click **Next 3/5** to move to the next stage of model configuration (Weather Set-up).

(Note – if you have not produced a valid elapsed time, that is, it is <= 0, then the system will not let you proceed beyond this dialogue. It is also worth noting that the system will accept null values for the latitude and longitude, and will therefore place your drift start position on the equator and at the Greenwich Meridian!).

3.3.3 Step 3 of 5: Weather Set-up



The third stage allows meteorological data to be entered. SARIS automatically generates the wind entry spreadsheet fields (not the data) for the data required to run the model. This includes:-

- 48 hours wind history before the Drift Start date and time
- Predicated wind for the period covering the Drift Start time to Datum date and time.

This information is entered as average surface winds over six hour periods or blocks. These six hour wind blocks are set up as follows for a 24 hour period;

0000 – 0600
0600 – 1200
1200 – 1800
1800 – 2400

(Note – sometimes the wind blocks will indicate times of 0700, 1300, 1900 etc. This normally happens when the computer clock time is set to GMT+1, or BST rather than UTC. The wind blocks will always be 0000 – 0600, etc., if the system is working in UTC).

The configuration of the wind blocks runs from 48 hours before the drift start time to the present time and on into the future down the screen. This might mean that the

most recent 6 hour blocks are hidden from view at the bottom of the screen, but can be accessed by using the scroll bar to the right hand side of the dialogue.

The upper box allows a table of meteorological data before and over the period of the incident to be entered. Values in the spreadsheet may be altered by clicking on a field and entering new data. To copy an entry to all wind blocks click on the value and then click on the **Copy To All** button. To add an additional wind block beyond those displayed, select the lowest table row (blank) and a date/time block will appear. This field can then be edited. To delete an entry, select the row number on the left-hand side and press the keyboard Delete button.

The **Wind Speed** and **Wind Direction** at a given Date and Time can be entered manually, or graphically, using the associated weather vane. Selecting a table row and clicking within the weather vane will automatically input the selected wind speed and direction. Note that the vane indicates the direction from which the wind is coming.

Meteorological data files may also be imported from the following external sources:

- weather data (*.wex* or *.txt*) file which may be created by the user (see Section 9 Appendix 2 for further information); or
- grid of wind forecast data, such as NetCDF or GRIB format data as supplied by a metocean forecasting organisation like the Met Office. (See the **VMISEnergy User Manual** for more information about importing gridded metocean data).

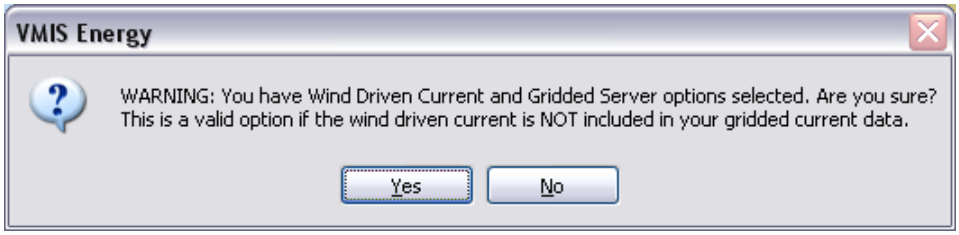
The **Use Gridded Server** check box should be checked on to enable drift calculations to be made from imported grids of metocean forecast data. However, if using the manual wind input (or *.wex /.txt* import) then this check box should remain checked **off**.

Weather data can be exported to an external (**.wex* or **.txt*) file, which can then be imported later into another model. The *.wex* or *.txt* file can be viewed and/or edited in Notepad. Clicking the **Import** or **Export** buttons generates a standard Windows **Open** or **Save As** box respectively, allowing you to enter the path and filename of the file to be imported or exported.

Wind Driven Current check box should be checked on (default setting) to generate a current vector, and checked off only if you want to omit the wind driven current vector from the model run (Rapid Response), or utilise an external metocean data source. Wind Driven Current is enabled by default.

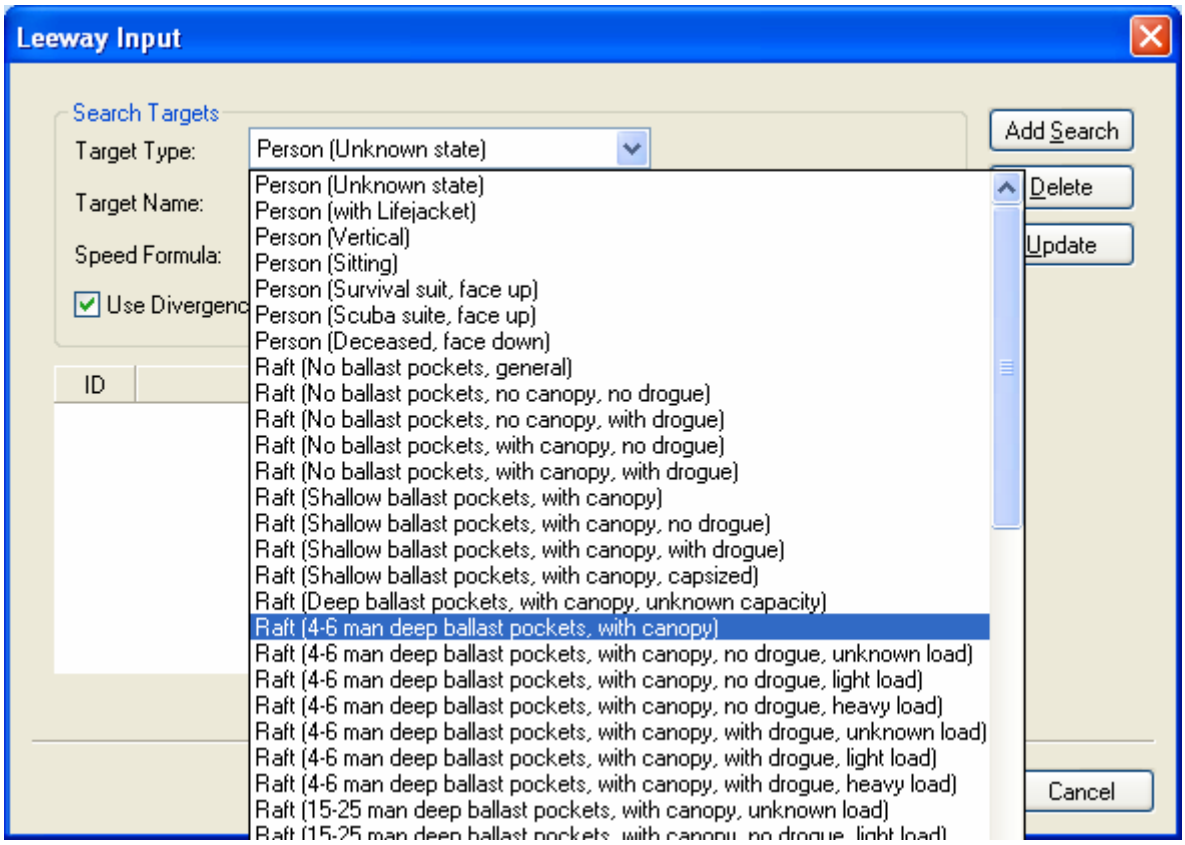
Caution – even if you do not want to utilise wind driven current, you must enter sufficient wind data to drive the leeway calculation. This will mean entering sufficient rows of data to cover the time between the drift start time and datum time, and could mean more than one 6 hour block.

Note – you should never have both the Wind Driven Current and Use Gridded Server check boxes activated at the same time, if your gridded current data includes an element of wind driven current. The following warning message will appear if both options are checked:


VMIS Energy
WARNING: You have Wind Driven Current and Gridded Server options selected. Are you sure?
This is a valid option if the wind driven current is NOT included in your gridded current data.
Yes
No

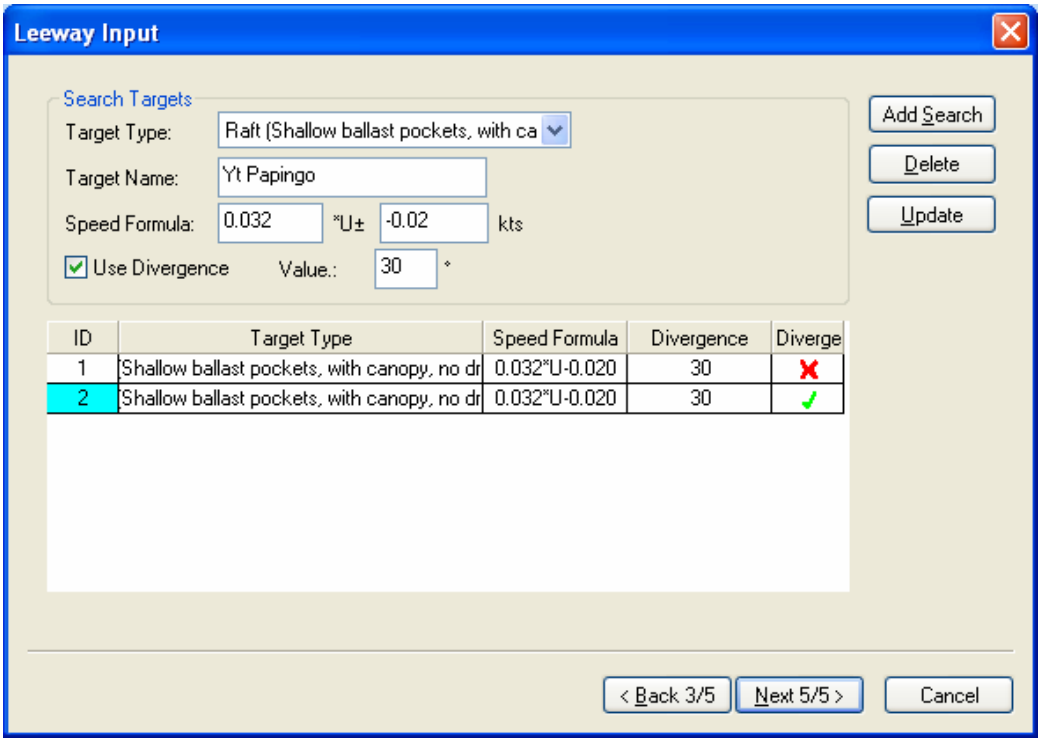
Click **Next 4/5** to move to the next stage of model configuration (Leeway Input).

3.3.4 Step 4 of 5: Leeway Input


Leeway Input
Search Targets
Target Type:
Person (Unknown state)
Target Name:
Speed Formula:
Use Divergenc
ID
Add Search
Delete
Update
Cancel
Person (Unknown state)
Person (with Lifejacket)
Person (Vertical)
Person (Sitting)
Person (Survival suit, face up)
Person (Scuba suite, face up)
Person (Deceased, face down)
Raft (No ballast pockets, general)
Raft (No ballast pockets, no canopy, no drogue)
Raft (No ballast pockets, no canopy, with drogue)
Raft (No ballast pockets, with canopy, no drogue)
Raft (No ballast pockets, with canopy, with drogue)
Raft (Shallow ballast pockets, with canopy)
Raft (Shallow ballast pockets, with canopy, no drogue)
Raft (Shallow ballast pockets, with canopy, with drogue)
Raft (Shallow ballast pockets, with canopy, capsized)
Raft (Deep ballast pockets, with canopy, unknown capacity)
Raft (4-6 man deep ballast pockets, with canopy)
Raft (4-6 man deep ballast pockets, with canopy, no drogue, unknown load)
Raft (4-6 man deep ballast pockets, with canopy, no drogue, light load)
Raft (4-6 man deep ballast pockets, with canopy, no drogue, heavy load)
Raft (4-6 man deep ballast pockets, with canopy, with drogue, unknown load)
Raft (4-6 man deep ballast pockets, with canopy, with drogue, light load)
Raft (4-6 man deep ballast pockets, with canopy, with drogue, heavy load)
Raft (15-25 man deep ballast pockets, with canopy, unknown load)

In the centre of the dialogue is situated a spreadsheet in which search objects or target(s) can be added by selecting the appropriate target type from the drop-down list of 66 options and clicking on the **Add Search** button. Selecting a target automatically retrieves the pre-stored leeway and divergence formula from the leeway database. This formula may be edited by the user in the **Speed Formula** and **Divergence** fields. Divergence is enabled by default. The use of Divergence can be disabled by toggling the Divergence check box.

Additional targets can be added by selecting more targets from the drop-down list and pressing **Add Search** button. The specific name of the target can be added in the **Target Name** field, if known (not a mandatory field).

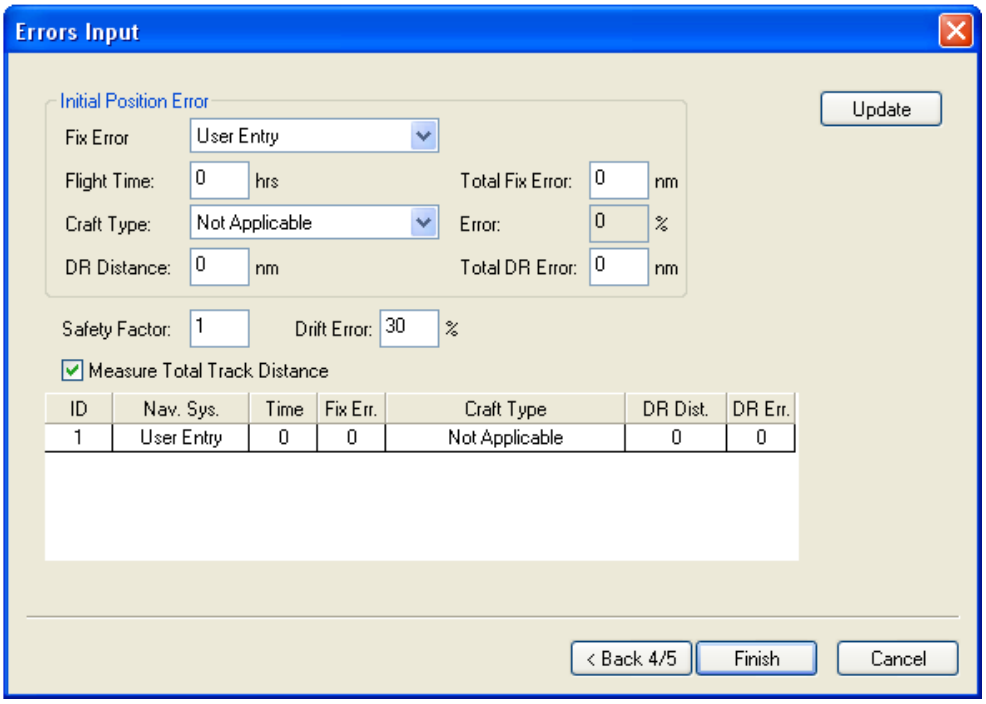


Targets already added to the spreadsheet may be edited by clicking on the relevant spreadsheet row, making any amendments in the target type, target name, leeway and divergence boxes and clicking on the **Update** button.

Targets can be removed from the spreadsheet by clicking on the relevant spreadsheet row and pressing the **Delete** button.

Click **Next 5/5** to move to the next stage of model configuration (Errors Input).

3.3.5 Step 5 of 5: Errors Input



The Errors Input dialogue allows the user to define the errors associated with target position fixing and DR navigation as well as assigning an appropriate drift error (default value is 30%).

SARIS automatically generates a spreadsheet entry for each target selected in the previous dialogue box. To change each entry:-

Select the spreadsheet row required by clicking anywhere in the row. Click on the dropdown menu next to **Fix Error** and select the navigational system used to determine the drift start position. If **DR error** is a factor as well as **Fix Error**, select from the craft type drop down menu. The appropriate % of DR distance will automatically fill in the **Error** window. Now enter the **DR Distance**, and the correct **Total DR Error** will automatically fill in.

The values displayed in the **Total Fix Error, DR Distance, Total DR Error, Safety Factor** and **Drift Error** boxes are loaded automatically from the in-built SARIS databases. Each field is open for editing by the user as required.

Drift Error is set to 30% by default but again may be edited by the user as required.

Safety Factor is a field which was utilised in the days of manual calculation. Manual calculations were very laborious and time consuming, and therefore if a second search area was required, then the first area was simply given a safety factor of 1.1 and the area size increased uniformly around the boundary by 10%; a third search area given a safety factor of 1.2, increased the area by 20%, and so on. In the case of SARIS, the more effective method of calculating a second search area is to change the datum time to the new time required, and have SARIS calculate a new area based on the drift. As this only takes a few minutes at most, it is by far the better method, and therefore on most occasions renders the **Safety Factor** obsolete. The **Safety Factor** therefore normally remains set at the default value 1.

Measure Total Track Distance is a check box which must always remain in the checked on condition. With this in the ‘on’ position SARIS will calculate the actual resultant distance of drift which is a curved or meandering track. This is the correct value on which to calculate the drift error. With the check box in the ‘off’ position, SARIS will measure the length of the resultant drift vector, the straight line vector between the DSP and Datum positions, and although this is a measurement used in the manual Search Planning methodology, it is not a true representation of the actual drift. It is therefore a less accurate measurement.

When the user is satisfied that all the values are correct, click on the **Update** button. Repeat this procedure for each target in the spreadsheet.

Click the **Finish** button to complete the set-up.

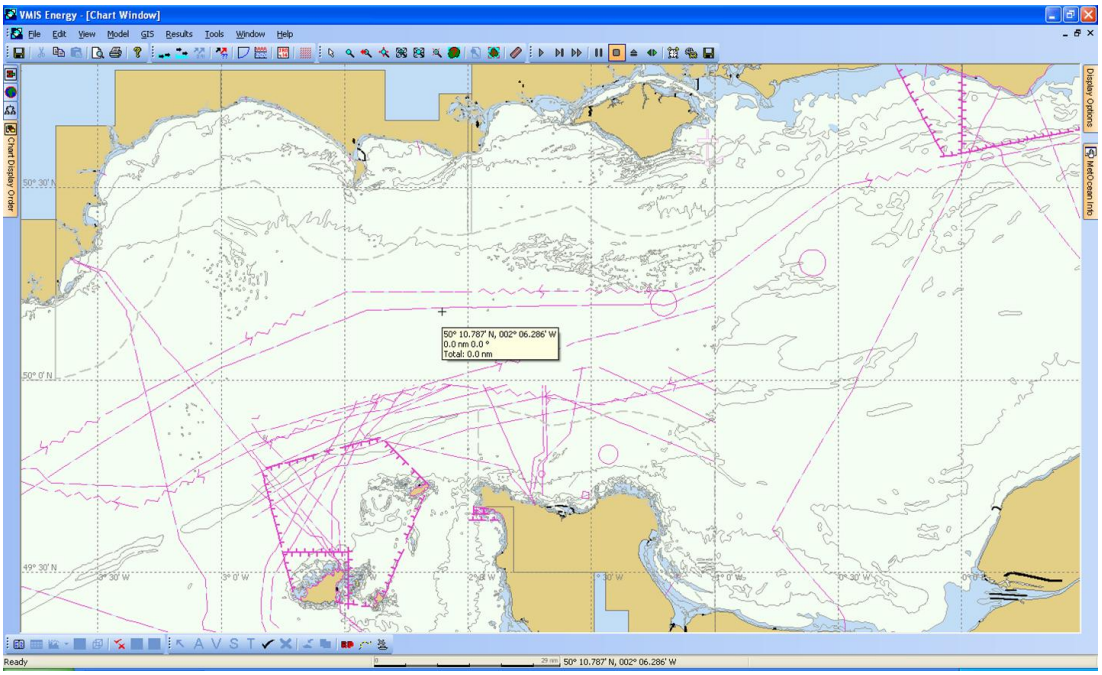
The *Model Run Manager* dialogue closes down, and an icon or icons of the selected search targets will now be displayed on the chart at the Drift Start Position.

3.4 CONFIGURING A DATUM LINE MODEL RUN

(Note – This section will only describe those elements of the Datum Line model run which are different to those of the Datum Point model run described in Section 3.3).

To set-up a new Datum Line model run select the **Datum Line** tab sheet in the *Model Run Manager* dialogue box. Double-click the **New Model** icon, or highlight it and click **Edit**. The first of five dialogue boxes will be displayed.

You can also set up a Datum Line model through the *Chart Window* **Context Menu → SARIS → Incident Locations.** Now left-click the mouse at the Last Known Position (LKP) and all Drift Start Positions (DSPs) ***in chronological order*** on the chart window. When you have set the last DSP double-click to open up the **Model Run Manager** and then proceed as before. If you want to fix the first DSP at the same place as the LKP, then fix the LKP, move the cursor away from the position, and then return to it making sure the attached position label reads "0.0nm o.oO Total: 0.0nm" (see figure below).


VMIS Energy - [Chart Window]
File Edit View Model GIS Results Tools Window Help
50° 10.787' N, 002° 06.286' W
0.0 nm 0.0 °
Total: 0.0 nm
Ready

3.4.1 Step 1 of 5: Plan Details

The first page of the Datum Line model setup is identical to Datum Point (see Section 3.3.1).

Click **Next 2/5** to move to the next stage of model configuration (Datum Line).

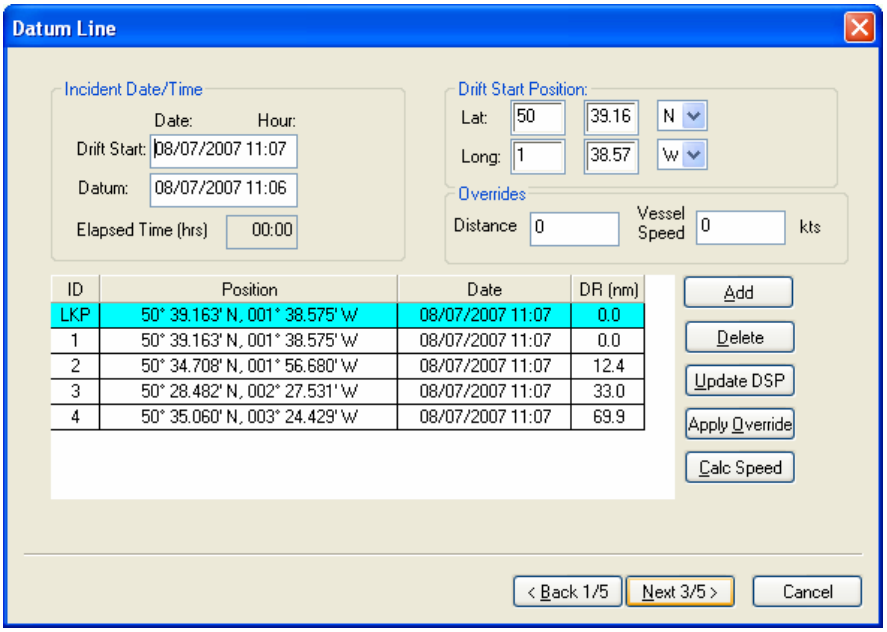
3.4.2 Step 2 of 5: Datum Line

Under the *Incident Date/Time* section:

The **Drift Start** indicates the drift start date and time and will default to the computer clock time. Double-clicking on the Date field will generate a calendar/clock dialogue box, allowing the date and time to be selected graphically.

The **Datum** indicates the datum date and time and will default to the computer clock time. The user may overtype the datum date and time or double-clicking on the Date field will generate a calendar/clock dialogue box, allowing the date and time to be selected graphically. The Datum date time group need only be modified once.

The **Drift Start Position** refers to the positions where the target was last seen or known to have started drifting from. The datum line model requires the user to **Add** the drift start positions to the spreadsheet by clicking the **Add** button. If setting up the DSPs manually, each one will require a date time group and a latitude and longitude to be input, before the Add button is activated. If the DSPs were selected by left-clicking on the chart window (as described above in Section 3.4), then they should all appear in the spreadsheet on entering the Datum Line Model Run Manager. DSPs may be removed by selecting the relevant entry in the spreadsheet and clicking the **Delete** button. To edit the DSP details already added to the spreadsheet, select the relevant DSP, make the appropriate changes in the Drift Start Position fields and click on the **Update DSP** button.


Datum Line
Incident Date/Time
Date:
Hour:
Drift Start: 08/07/2007 11:07
Datum: 08/07/2007 11:06
Elapsed Time (hrs) 00:00
Drift Start Position:
Lat: 50 39.16 N
Long: 1 38.57 W
Overrides
Distance 0
Vessel Speed 0 kts
ID | Position | Date | DR (nm)
LKP | 50° 39.163' N, 001° 38.575' W | 08/07/2007 11:07 | 0.0
1 | 50° 39.163' N, 001° 38.575' W | 08/07/2007 11:07 | 0.0
2 | 50° 34.708' N, 001° 56.680' W | 08/07/2007 11:07 | 12.4
3 | 50° 28.482' N, 002° 27.531' W | 08/07/2007 11:07 | 33.0
4 | 50° 35.060' N, 003° 24.429' W | 08/07/2007 11:07 | 69.9
Add
Delete
Update DSP
Apply Override
Calc Speed
< Back 1/5
Next 3/5 >
Cancel

Distance Override: In cases where a Datum Line model run has been split into component parts (to cater for "dog legs" i.e. alterations of course along the passage) the *Overrides* **Distance** field can be updated to enter the distance already covered on previous legs. This will ensure that the model is anchored to the LKP of the first leg of passage for DR distance and error calculations. Enter a distance and click **Apply Override**, and the **DR (nm)** distances for each DSP will be updated accordingly.

Vessel Speed Override: Once the LKP and all DSPs have been set, if the intended average passage speed of the vessel is known, this can be entered in the **Vessel Speed** field. Click **Apply Override** and the time at each of the DSPs will be calculated and entered automatically in the spreadsheet.

Vessel Speed Override: Alternatively, if the intended average passage speed is not known, but an ETA is known for the destination, then that ETA can be entered against the last DSP. *(Note – the last DSP must have been set at the destination,*

e.g. entrance to harbour, river estuary etc). Now click **Calc Speed**, and the average speed required for the vessel to reach the destination at the ETA will be calculated automatically and shown in the **Vessel Speed Overrides** field. Now click **Apply Override** and each DSP will have been modified according to the calculated speed.

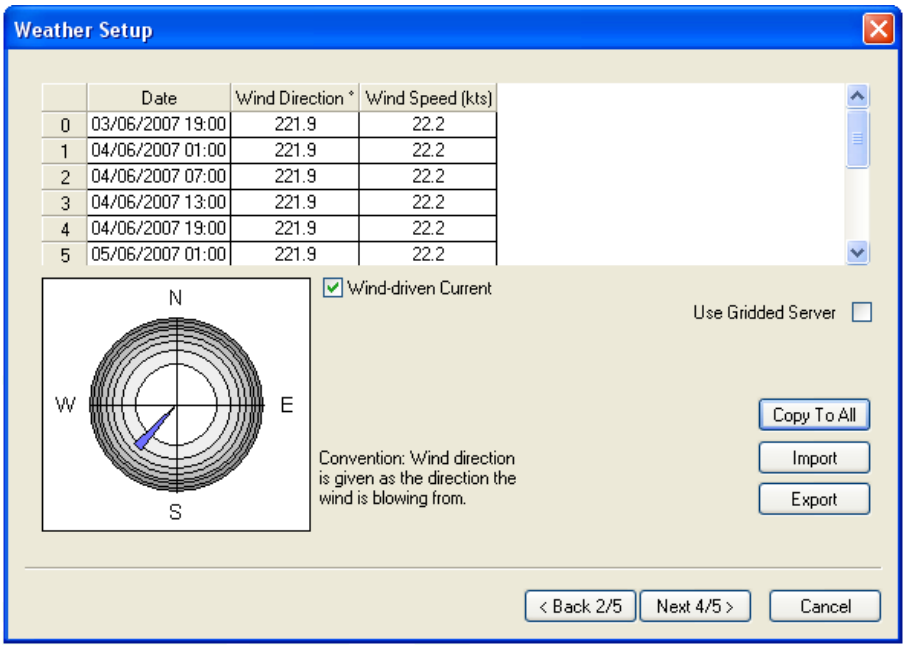
Update DSP: When the Datum Line **Model Run Manager** is first entered and, whether the DSP locations were entered using the chart window or manually typed in to the appropriate fields, all the DSPs will remain set to computer time. This is obviously not correct, since the vessel cannot have been at all the DSPs at the same time. If the user then attempts to move forward to the next data input screen 3/5, SARIS will offer a warning **"Too many DSPs all appear to show the same drift start time, do you want to continue ?"**. This feature helps avoid the frequent mistake of failing to update DSP times.

Man Overboard: The datum line model can be used successfully to model for a person who has fallen overboard from a vessel, but where the exact time of the accident is unknown. In this case, the Datum Line is formed by establishing the position of the vessel when the person was last seen, and mapping out the passage since then and until the person was noticed missing. Several DSPs can then be placed in between these start and finish locations and the datum line model implemented.

Click **Next 3/5** to move to the next stage of model configuration (Weather Set-up).

3.4.3 Step 3 of 5: Weather Set-up

The third page of the Datum Line model setup is identical to Datum Point (see Section 3.3.3).



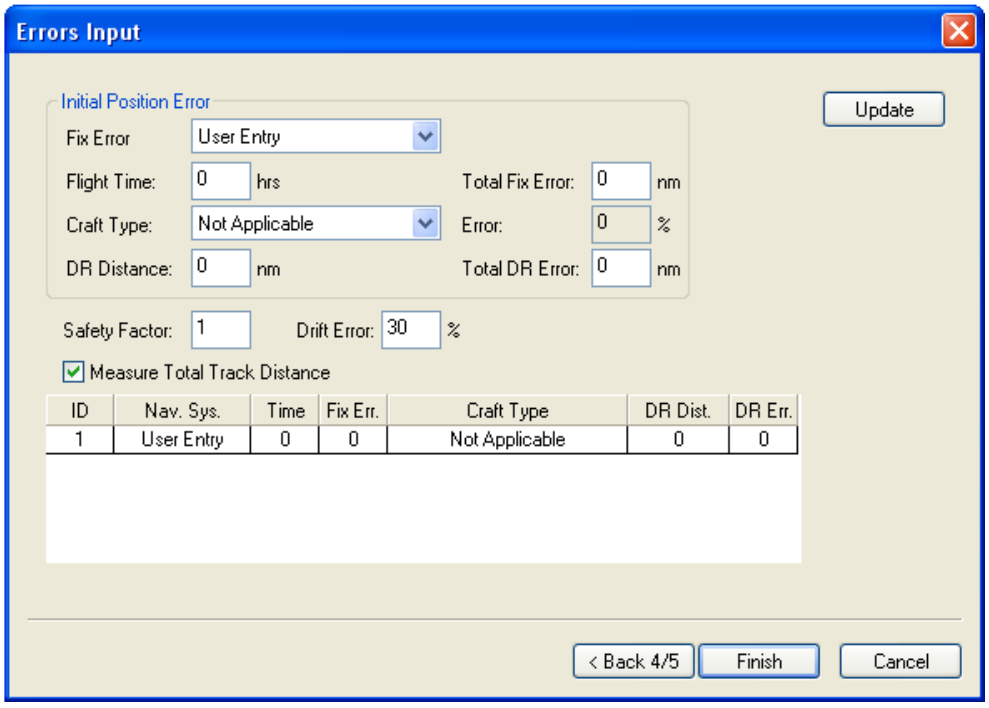
Click **Next 4/5** to move to the next stage of model configuration (Leeway Input).

3.4.4 Step 4 of 5: Leeway Input

The fourth page of the Datum Line model setup is identical to Datum Point (see Section 3.3.4).

Click **Next 5/5** to move to the next stage of model configuration (Errors Input).

3.4.5 Step 5 of 5: Errors Input



The **Errors Input** dialogue is identical in appearance to that of the Datum Point model, however the theory and practice of the Datum Line model requires that the DR error is always activated. This is designed to allow for differences between the passage plan the SARIS user has applied and the passage actually sailed by the vessel. It is not DR error in the formal sense of Dead Reckoning in navigational terms, but the process fulfils the requirement of indicating the lack of precise knowledge of the passage actually carried out by the vessel and adds an additional error factor. In the case of Datum Line models, the DR distance will be greyed out and does not need to be calculated, since SARIS has already calculated this value from previous input data. In this case, it is sufficient to select the appropriate craft from the **Craft Type** field and accept the SARIS suggestion for the **Error** field.

Click the **Finish** button to complete the model set-up.

The *Model Run Manager* will close down and icon or icons of the selected search targets should be displayed on the chart at the Drift Start Positions. *(Note – if the LKP and DSP1 are not in the same place, then there will not be an icon displayed at the LKP, since the drift from this position will not be modelled).*

3.5 CONFIGURING A BACKTRACK MODEL RUN

(Note – This section will only describe those elements of the Datum Line model run which are different to those of the Datum Point model run described in Section 3.3).

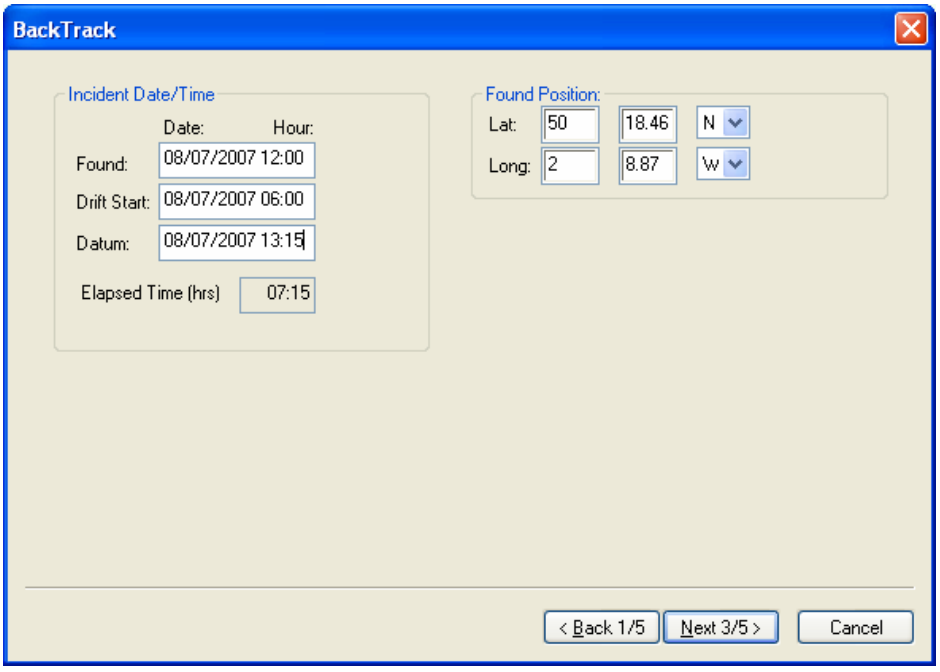
To set-up a new Backtrack model run select the **Backtrack** tab sheet in the *Model Run Manager* dialogue box. Double-click the **New Model** icon, or highlight it and click **Edit**. The first of five dialogue boxes will be displayed (Plan Details). Don't forget that you can set up the found position by utilising the chart window **Context Menu** → **SARIS** → **Incident Location** exactly in the same way as the Datum Point can be implemented.

3.5.1 Step 1 of 5: Plan Details

The first page of the Datum Line model setup is identical to Datum Point (see Section 3.3.1).

Click **Next 2/5** to move to the next stage of model configuration (Backtrack).

3.5.2 Step 2 of 5: Backtrack



Under the **Incident Date/Time** section:

The **Found** box indicates the date and time at which the target was found and will default to the current computer clock time. Double-clicking on the Date field will generate a calendar/clock dialogue box, allowing the date and time to be selected graphically.

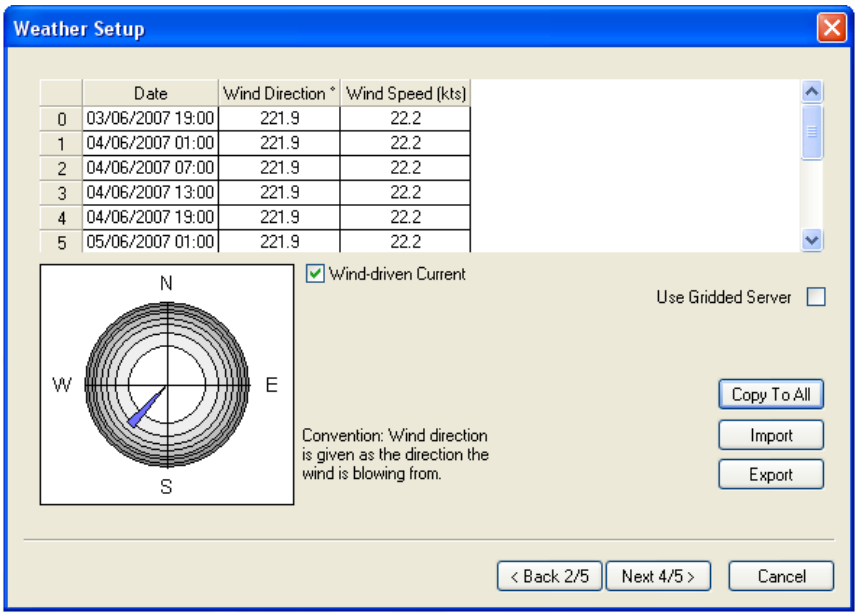
The **Found Position** refers to the position the target was found and will most likely be the position originating from the navigational equipment on board the "finding" vehicle. If the model was started by specifying the incident location on the chart, that

position will be displayed in the dialogue box. If not, the position will be shown as zeros. The Found Position may be manually overwritten.

Click **Next 3/5** to move to the next stage of model configuration (Weather Set-up).

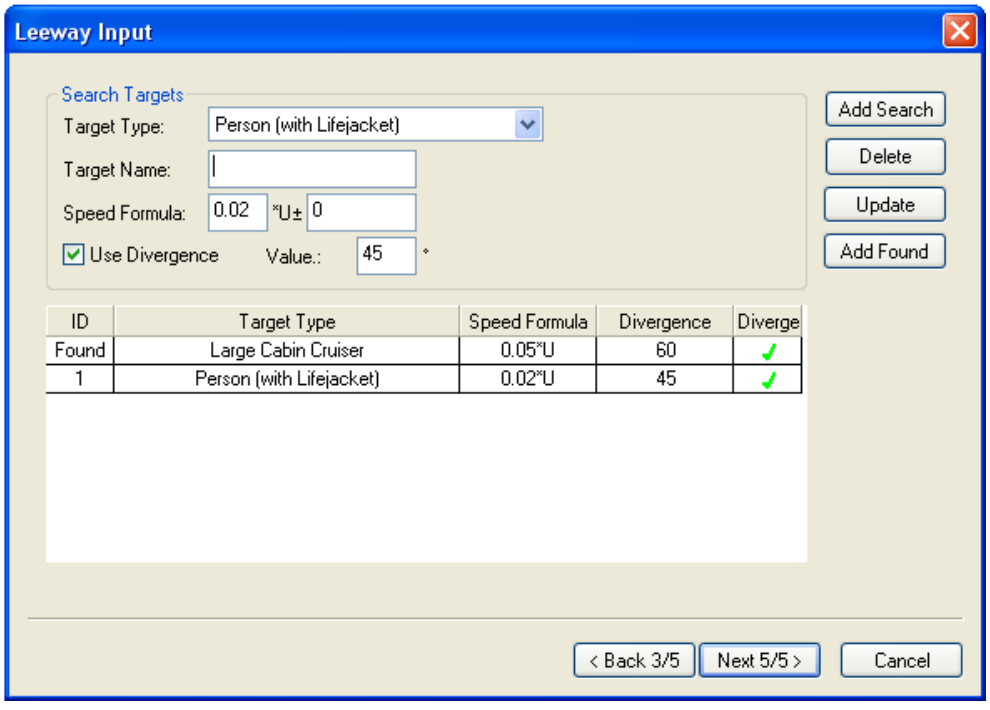
3.5.3 Step 3 of 5: Weather Set-up

The third page of the Datum Line model setup is identical to Datum Point (see Section 3.3.3).



Click **Next 4/5** to move to the next stage of model configuration (Leeway Input).

3.5.4 Step 4 of 5: Leeway Input

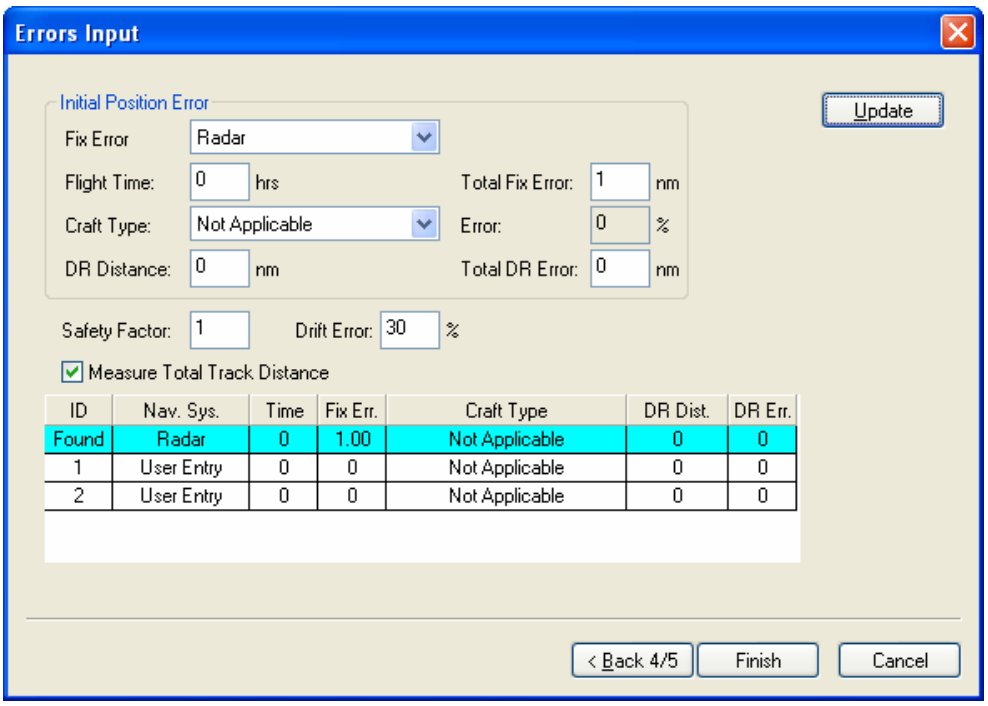


Note that in the Backtrack model setup one “Found” target is required. Select the target type required (from the drop down menu) and click once on **Add Found**. The search targets can be added by selecting more targets from the drop-down list and pressing the **Add Search** button. The specific name of the target can be added in the **Target Name** field, if known.

The remainder of this dialogue works in exactly the same way as the Datum Point Model, where a number of targets can be selected.

Click **Next 5/5** to move to the next stage of model configuration (Errors Input).

3.5.5 Step 5 of 5: Errors Input



This dialogue is completed in much the same way as for a Datum Point. However, the fix and DR errors in this case apply to the error associated with the finding vehicle, and not the drift objects or targets. It is therefore only necessary to update those errors in relation to the **Found** target, and no need to repeat for each **Search** target.

Click the **Finish** button to complete the set-up.

The Model Run Manager will close down and an icon for the selected found targets will be displayed on the chart at the Drift Start Position.

3.6 CONFIGURING A RAPID RESPONSE MODEL

To configure a Rapid Response Model, the Datum Point **Model Run Manager** is used and the following steps followed:

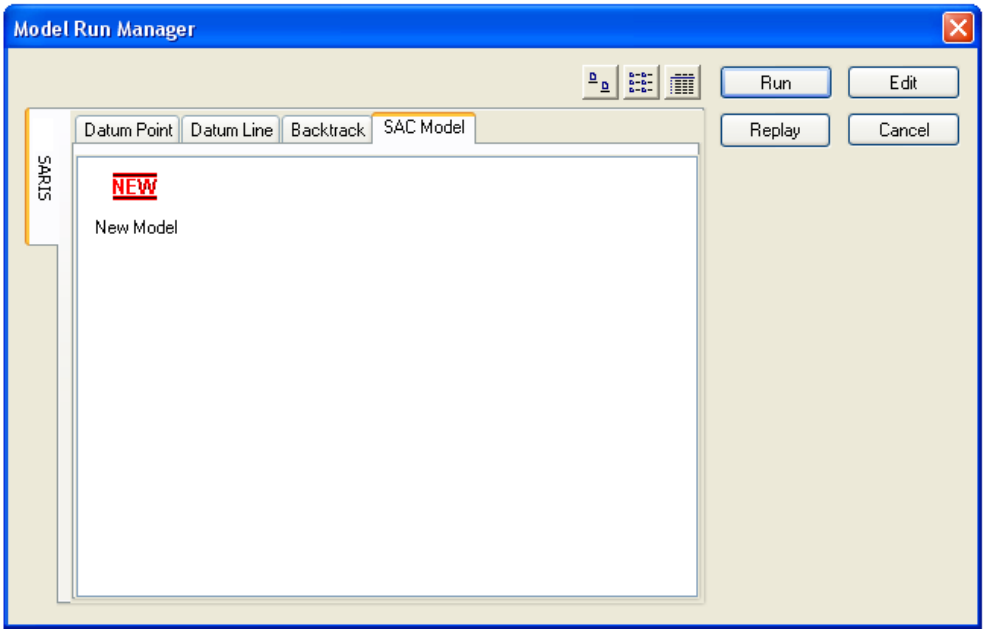
i. In the **Weather Setup** dialogue the wind driven current is checked off, and wind information entered only for the period between the drift start and datum times.

ii. In the **Leeway Input** dialogue the divergence value is switched off.

The Rapid Response model will therefore result in a square search area containing only one datum – the downwind datum.

3.7 CONFIGURING A SAC ONLY MODEL RUN

To set-up a new Search Area Coverage (SAC) model run select the **SAC Model** tab sheet in the *Model Run Manager* dialogue box. Double-click the **New Model** icon, or highlight it and click **Edit**. Alternatively, the SAC Model can be invoked through the *chart window* **Context Menu → SARIS → Draw Search Area** tool. Click on the north west corner of the area required and drag the search area box out to the south east.



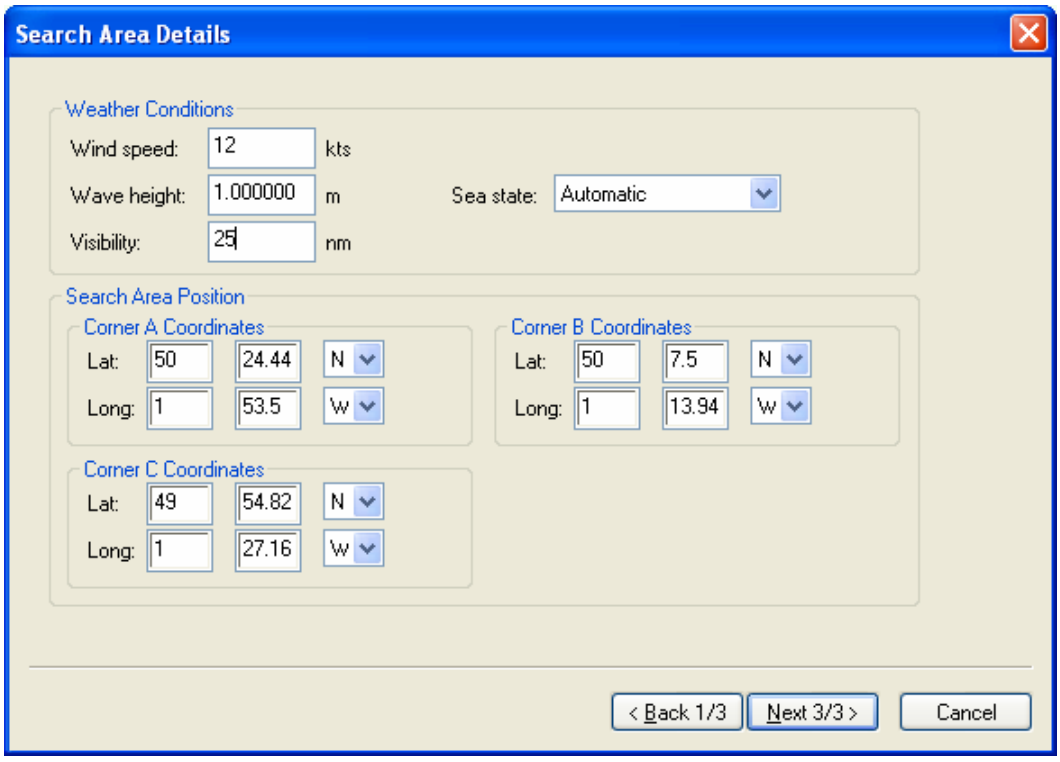
The first of three dialogue boxes will be displayed (Plan Details).

3.7.1 Step 1 of 3: Plan Details

The first page of the Datum Line model setup is identical to Datum Point (see Section 3.3.1).

Click **Next 2/3** to move to the next stage of model configuration (Search Area Details).

3.7.2 Step 2 of 3: Search Area Details



This dialogue box allows the user to specify weather conditions at the time of the search. To enter the wind speed, type a value in the **Wind Speed** field**.** SARIS will automatically calculate the **Wave Height**. The Wave Height value may be overridden by over-typing the value displayed. Alternatively, the **Wave Height** can be selected through the **Sea State** drop down menu and selecting the required Beaufort Scale number. This would be used, for example, where the search area is situated in an area of wind against tide conditions where the **Wave Height** would be greater than normal for the prevailing wind speed. In default mode, **Automatic**, SARIS calculates sea state from the wind speed entered in the **Wind Speed** field.

(Note – it is the wave height/sea state which is the important input in this dialogue, since it is the wave height not merely the wind speed which will govern the visibility of the target, and hence in defining the appropriate sweep width).

To enter the visibility distance, type a value in the **Visibility** field.

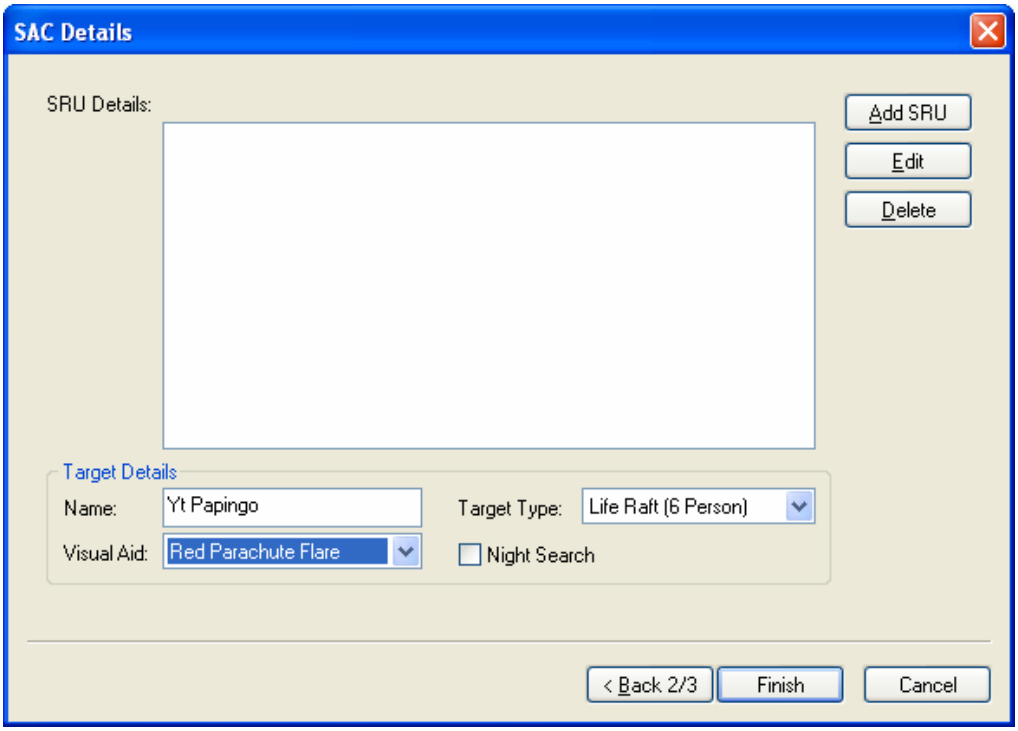
If the model was started by specifying the rectangular Search Area on the chart, the positions of the three corners of the area will be displayed in the dialogue boxes under **Search Area Position**. If not, the positions will be shown as zeros. To define or amend the Search Area Position, co-ordinates may be entered manually in the boxes provided. Co-ordinates are required for three positions A, B and C, where A is the most northerly point and B and C are sequential points moving clockwise from point A.

(Note – if manually inputting the corner co-ordinates, it is highly unlikely that the user will have defined an exact rectangle. One or more of the co-ordinates are likely to be misaligned, even if only by a small amount. In these cases, SARIS is configured to

re-draw the area to engineer an exact rectangle slightly larger that required, and with all the user defined co-ordinates within the area or at the very least on the boundary).

Click **Next 3/3** to move to the next stage of model configuration (SAC Details).

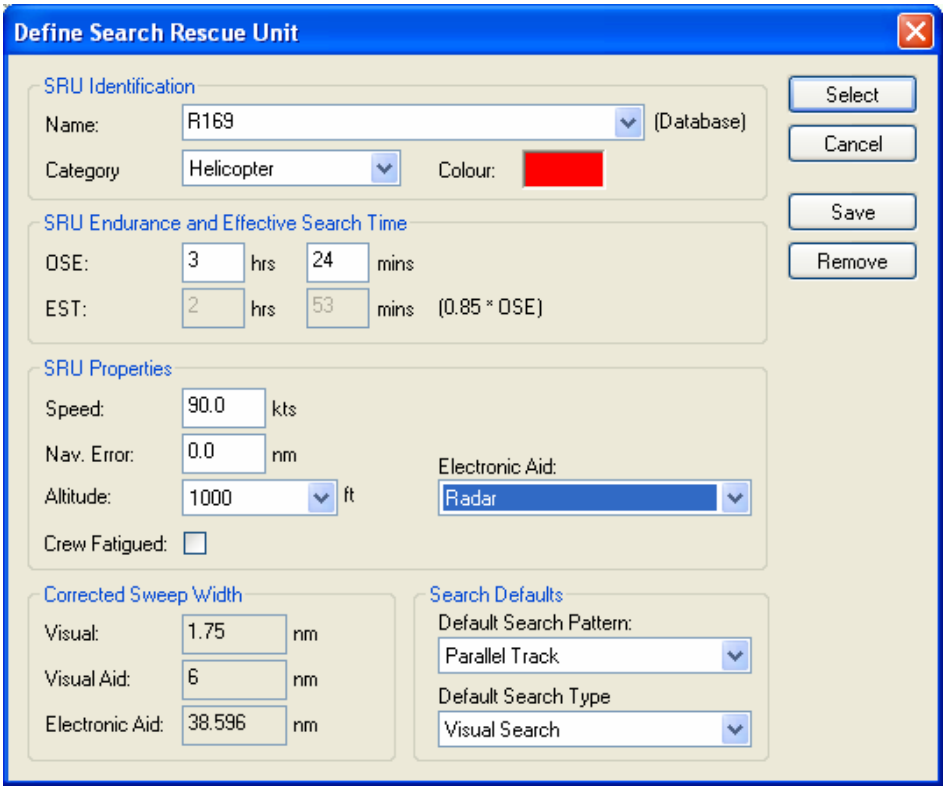
3.7.3 Step 3 of 3: SAC Details



This third stage allows the user to define the search target and configure SRUs. **Target Name** refers to the name or description of the target e.g. “Yt Papingo”. To edit the name click on the spreadsheet cell called **Name** and manually type a new name. To select the appropriate **Target Type** from the drop-down list, click on the downward pointing arrow to reveal the drop down menu. Scroll through the entries and select the required target type by clicking on the left mouse button.

If the search is to be conducted at night click the **Night Search** check box, a tick will appear. If any visual aid is being used this can be selected by clicking on the down arrow next to the **Visual Aid** box, scrolling through the entries and clicking on the required visual aid. The contents of this drop down menu automatically changes depending on whether a night or day search is selected.

To configure available SRUs, Click on the **Add SRU** button. The following dialogue box is displayed (**Define Search Rescue Unit**):-



All of the information contained in the **Define Search Rescue Unit** dialogue box reflects the information in the UK Coastguard CG3 manual. It is possible to pre-configure declared SRUs which operate in a particular area or district and save those parameters, using the **Save** button. Pre-configured SRUs may be loaded by clicking on the drop-down arrow next to **Name** under *SRU Identification* and selecting the name of the required SRU.

To configure a new SRU type the name of the unit in the **Name** field. Select the matching SRU Category by clicking on the down arrow next to the **Category** field. There are five choices:-

- Fixed Wing Aircraft
- CG Helicopter
- Helicopter
- Vessel (90ft)
- Boat (40ft)

To change the colour associated with the SRU click on the colour box, you will see the standard windows colour palette. Select a new colour for the SRU and click on **OK.** *(Note – SARIS is configured to automatically assign different colour values to the first 15 SRUs defined for any particular model).*

Enter the On Scene Endurance of the SRU in the **OSE** box. (*Note – the Effective Search Time (EST) value used in the calculation is automatically calculated and displayed in the greyed out box labelled **OSE (0.85*OSE)**).*

Under the SRU properties section, type the SRU **Speed** and **Navigation** error in the boxes provided. **Altitude / Height of radar** is selected from the drop down menu, which automatically changes depending upon the SRU category, selected earlier.

For an aircraft the height relates to the *altitude* the aircraft is flying at, and for a surface vessel it relates to the *height of the radar scanner* above sea level.

If the crew are fatigued click the **Crew Fatigued** check box; a tick will appear.

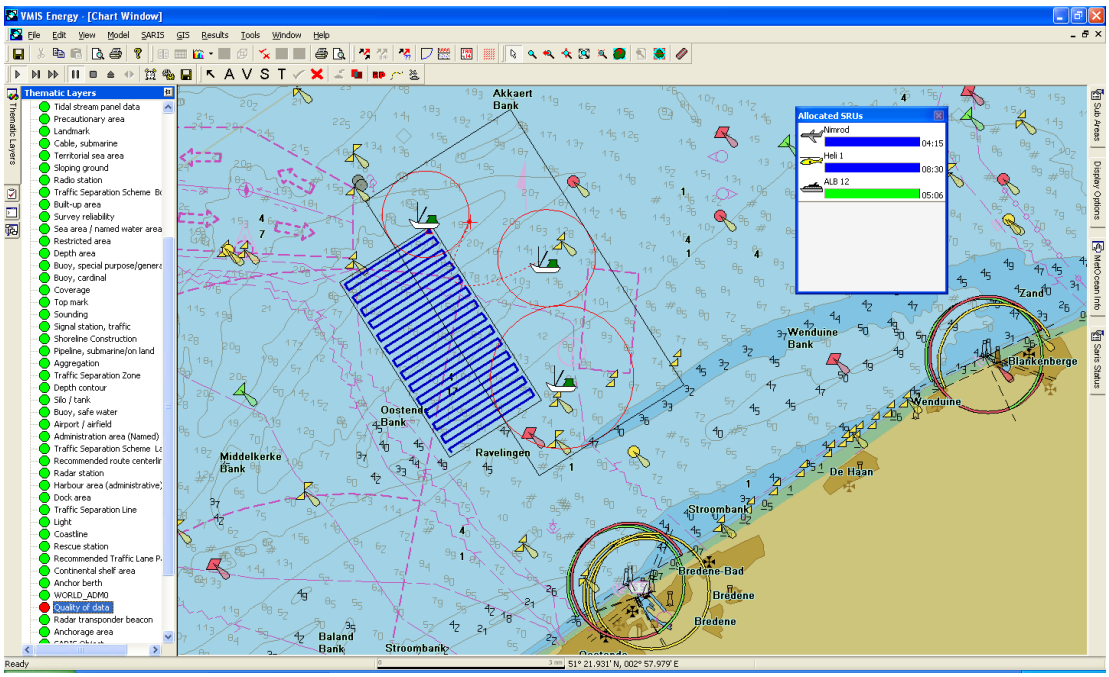
If Radar is being used as an electronic search aid click on the down arrow next to the **Electronic Aid** box and select **Radar**.

Once all the appropriate fields contain information, the appropriate sweep widths can be viewed in the *Corrected Sweep Width* table towards the bottom left of the dialogue. These are critical fields, which cannot be changed, and are therefore greyed out.

Search Defaults: The **Default Search Pattern** field defaults to **Parallel Track** search and the **Default Search Type** defaults to **Visual Search**. The defaults for both fields can be changed by using the appropriate drop down menus, however, a final decision on the correct setting to use does not need to be taken at this stage, and both can be altered by the user later in the SAC process.

When all information has been entered, the user may add the configuration to the SRU database by clicking on the **Save** button. Previous entries may be deleted by selecting the SRU from the **Name** drop menu and clicking on the **Remove** button. To add the current SRU to the active search click on the **Select** button. You will be returned to the SAC Details dialogue box and the new SRU will show in the list under SRU Details. Repeat the above procedure to add all available SRUs to the active search plan.

Properties of selected SRUs can be amended by clicking on the **Edit** button. Selected SRUs can be removed from the list by clicking on the **Delete** button. When all SRUs have been configured, click on the **Finish** button. All available SRUs will be shown in the **Allocated SRUs** *status pane* as icons alongside an Effective Search Time “fuel” gauge.



4. RUNNING A SAD MODEL

Once a SAD model (either Datum Point, Datum Line or Backtrack) has been configured, the target icon(s) will appear on the chart at the specified Drift Start or Found positions. To start the simulation, the **Model Run** button in the *Control* toolbar should be pressed, or **Play** selected from the **Model** menu. The target(s) will then start to move. The SARIS SAR Plan simulation runs with a time-step of 5 minutes, which means that the calculations of transport and position are carried out for every 5 minutes of model time.

4.1 MODEL CONTROL BUTTONS

The following buttons (also available as menu options under the Model menu) control the SAR Plan simulation;

. Starts the SAR Plan simulation at the slow-time simulation rate which allows the user to clearly see the movement and progression of target movement.

Model Advance. This button allows the user to advance the simulation by one single time-step (5 minutes). This button can be used repeatedly to view the simulation step by step.

Model Fast Forward. This button allows the user to advance the simulation in fast-time. The screen display is updated at hourly intervals using this button. (NOTE - The Run button must be pressed before the Fast Forward button will function.)

Pause Model. This button pauses the simulation at the current model time. The Pause button is a toggle button, so to continue the simulation, the Pause button is pressed a second time. It is recommended that the Pause button is used if display changes are being carried out e.g. configuration of currents display, report requests etc.

Stop Model. The Stop button re-sets the simulation to the beginning but does not cancel the user set-up. The simulation can simply be re-started from the beginning again by pressing the Run button. Alternatively, details in the SAR Plan configuration can be changed before continuing.

Model Reset. The Reset button completely resets the SAR Plan simulation with a request as to whether the SAR Plan is to be saved.

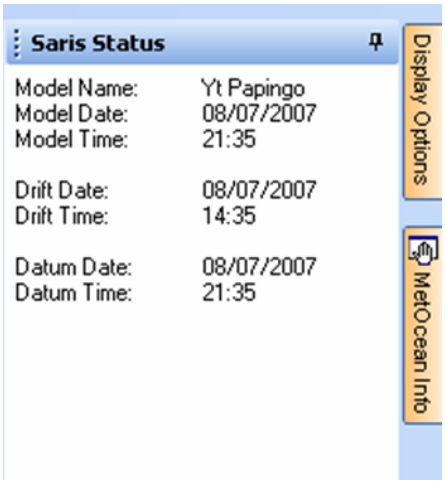
Save. The Save button will save the model run. If the model run has been saved previously, then the user will be prompted to change the model name.

Centre on Model. The Centre on Model button can be used if the drift start position is not showing on the GIS screen. Rather than having to search for the model icon, if this button is active, then SARIS will automatically zoom to place the DSP in the centre of the visible screen.

Zoom with Model Extents. Even if the DSP icon is visible on the GIS, when the model runs, the zoom level may not be sufficient to keep the entire model in view. If this button is active, the SARIS zoom level will keep pace with the model, which will be visible at all times. *(Note – depending upon the capacity and speed of computer the user is working on, this function may cause the model run to be slow and "jerky". This is because SARIS is refreshing the model run every 5 minutes and simultaneously re-writing the chart view to successive zoom levels).*

Run Real Time. The SAD model can be set to run to real time, that is the computer clock time. This is achieved by clicking the **Real-Time** button or selecting **Model → Run Real Time**. When this function is activated the search area displayed will be an accurate representation of the actual search area at all times. In this mode, the model will update every 5 minutes.

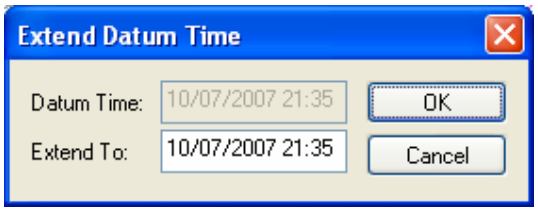
4.2 SEARCH AREA STATUS PANE



During the SAD model run the SARIS status pane reports the Model Name, Model Date and Time, Datum Date and Datum Time. Double clicking on the SARIS status pane presents the user with the model set-up dialogue boxes in tabbed format. Model set-up parameters may be viewed (but not edited) in this way at any time during the model run.

4.3 EXTEND DATUM TIME

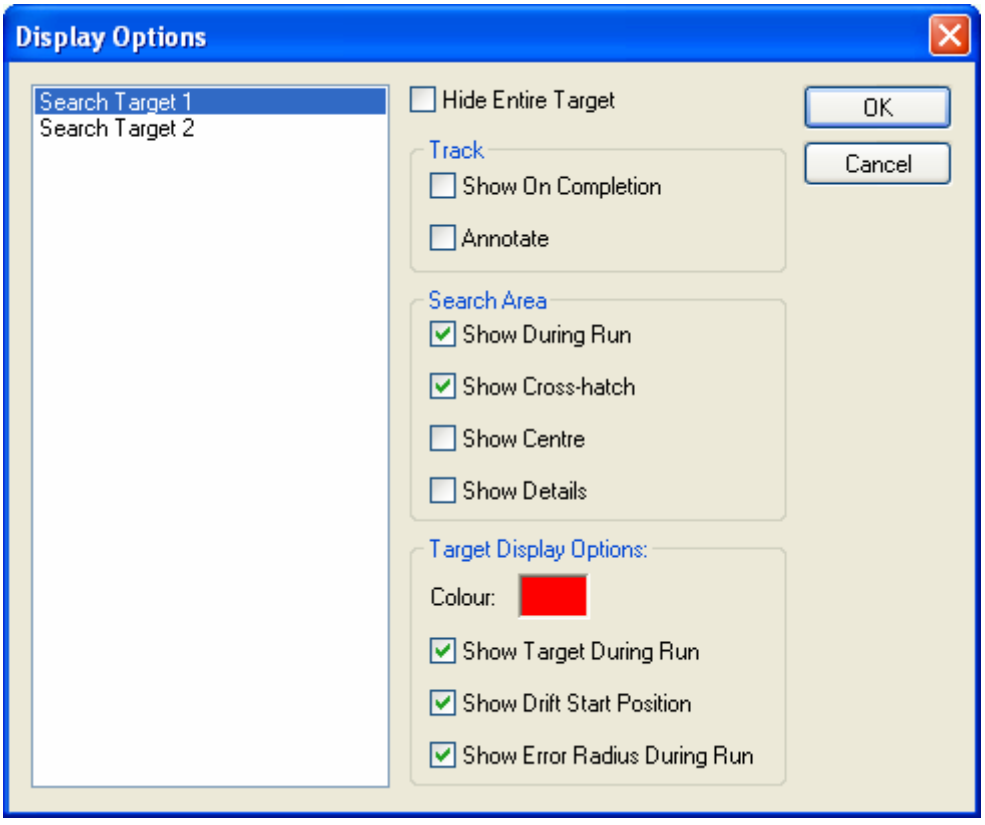
The Extend Datum Time function is activated through **Model → Extend Datum Time.** The following dialogue box opens:



The original datum time will be shown in the upper field, and the required datum time can be entered in the **Extend to:** field. Now when the model runs, the new datum area will be displayed on the GIS, along with an outline of the original datum area. Only two areas, the original and one chosen extended datum time area can be shown simultaneously, although the extended time can be re-modelled as often as required.

4.4 SAD MODEL DISPLAY OPTIONS

At any time before, during or after a SAD model run, various display options may be toggled on and off. To open the display option dialogue box, click on the menu bar **Results → SARIS → Display**. The following dialogue box is displayed:-



Display properties may be changed individually for each target. Select the target from the left hand list by clicking once on the target name. To change the display option for that target, check the square box next to the display property. These include:-

Hide Entire Target – This hides the target and all associated track and target displays. Default setting is off.

Track

Show on Completion - This shows the target drift track at the end of the model run. The default setting is off.
Annotate – This option shows a time and date stamp on the track at 1-hour intervals. The default setting is off.

Search Area

Show During Run – This shows the search area during the run. The default is on.
Show Cross-Hatch – This displays a cross hatch over the search area in the selected target colour. The default setting is off.
Show Centre – This displays two perpendicular lines that cross at the centre of the search area. The default setting is off.
Show Details – This displays the search area and datum time during the model in a window next to the search area. The default setting is off.

Target Display Options

Colour – This option changes the colour of the target track and crosshatching. Double clicking on the colour rectangle displays the windows colour palette.
Show Target – This option shows the target DW, Dwmax and Dwmin positions on the chart. The default setting is on.
Show Drift Start Position - Places a marker at the Drift Start Position. The default setting is on.
Show Error Radii During Run – This option toggles the target error radii display on and off. The default setting is on.

4.5 REPORTS – SAD MODEL RUNS

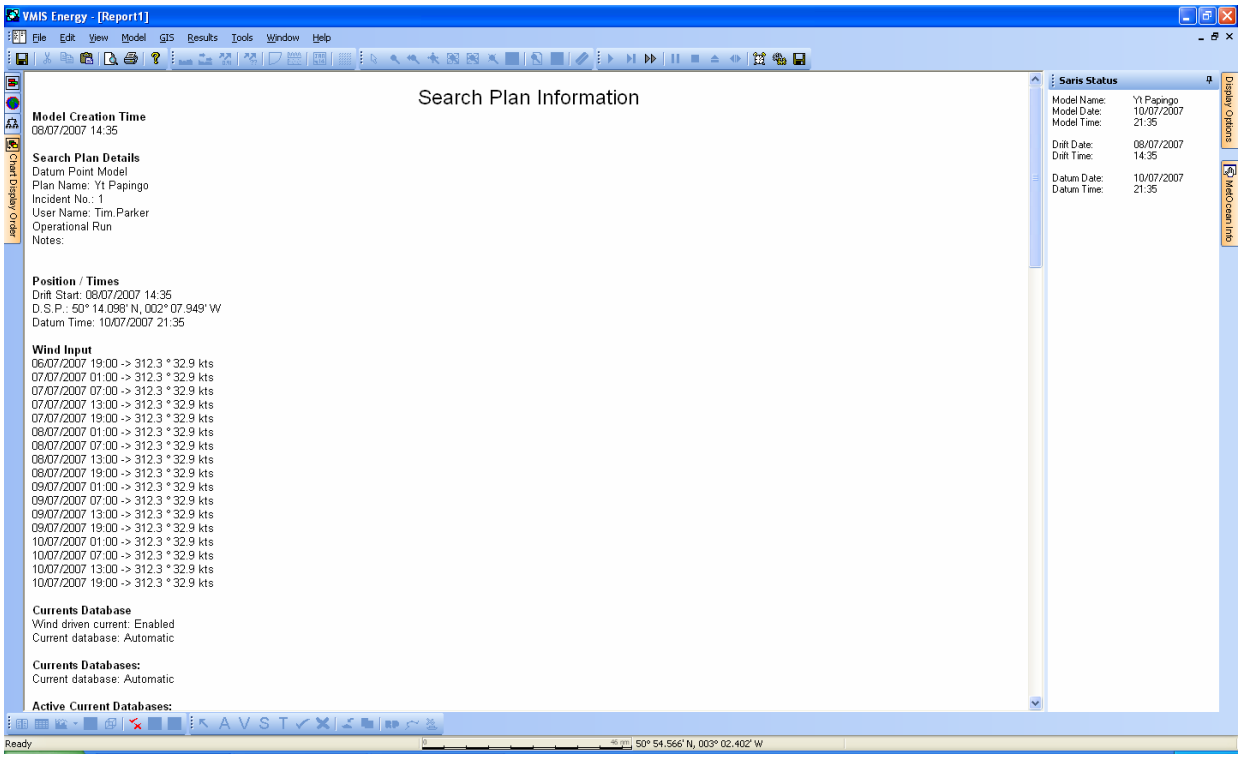
At any time during a SAD model run, SARIS can provide a text-based report or an xml report. To obtain a text-based SAD report click on the menu bar **Results** → **Report.** The current model will output a report to notepad as shown in the figure overleaf.

To save the report, click on the menu bar **File** → **Save As** (or click on the **Save** button) and select the file type and location to which to save the file.

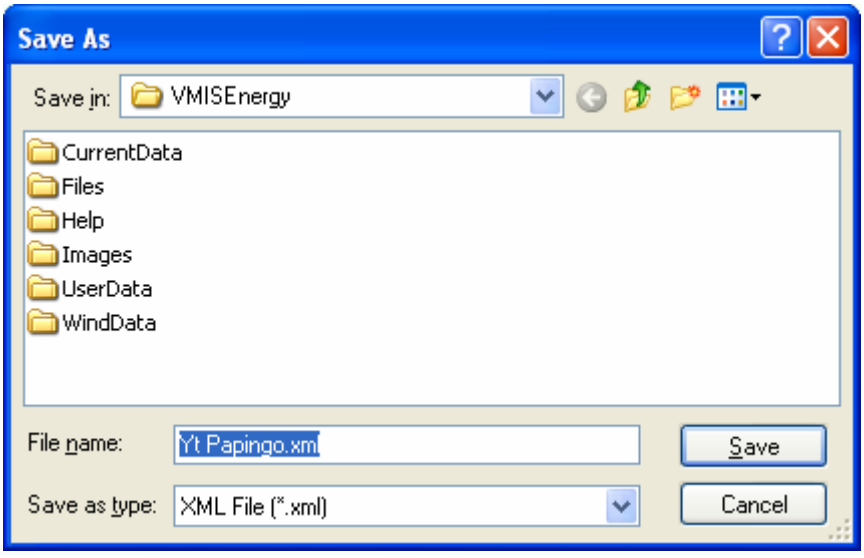
To view a Print Preview of the report, click on the menu bar **File** → **Print Preview** (or click on the **Print Preview** button) and select the file type and location to which to save the file.

To print the report, click on the menu bar **File** → **Print** (or click on the **Print** button) and select the file type and location to which to save the file.

The report can be closed by clicking on the **lower** of the two in the top right hand corner of the screen. *(Note – clicking on the top red will close SARIS!)*


VMIS Energy - [Report1]
File Edit View Model GIS Results Tools Window Help
Search Plan Information
Model Creation Time
08/07/2007 14:35
Search Plan Details
Datum Point Model
Plan Name: Yt Papingo
Incident No.: 1
User Name: Tim.Parker
Operational Run
Notes:
Position / Times
Drift Start: 08/07/2007 14:35
D.S.P.: 50° 14.098' N, 002° 07.949' W
Datum Time: 10/07/2007 21:35
Wind Input
06/07/2007 19:00 -> 312.3 ° 32.9 kts
07/07/2007 01:00 -> 312.3 ° 32.9 kts
07/07/2007 07:00 -> 312.3 ° 32.9 kts
07/07/2007 13:00 -> 312.3 ° 32.9 kts
07/07/2007 19:00 -> 312.3 ° 32.9 kts
08/07/2007 01:00 -> 312.3 ° 32.9 kts
08/07/2007 07:00 -> 312.3 ° 32.9 kts
08/07/2007 13:00 -> 312.3 ° 32.9 kts
08/07/2007 19:00 -> 312.3 ° 32.9 kts
09/07/2007 01:00 -> 312.3 ° 32.9 kts
09/07/2007 07:00 -> 312.3 ° 32.9 kts
09/07/2007 13:00 -> 312.3 ° 32.9 kts
09/07/2007 19:00 -> 312.3 ° 32.9 kts
10/07/2007 01:00 -> 312.3 ° 32.9 kts
10/07/2007 07:00 -> 312.3 ° 32.9 kts
10/07/2007 13:00 -> 312.3 ° 32.9 kts
10/07/2007 19:00 -> 312.3 ° 32.9 kts
Currents Database
Wind driven current: Enabled
Current database: Automatic
Currents Databases:
Current database: Automatic
Active Current Databases:
Saris Status
Model Name: Yt Papingo
Model Date: 10/07/2007
Model Time: 21:35
Drift Date: 08/07/2007
Drift Time: 14:35
Datum Date: 10/07/2007
Datum Time: 21:35
Ready
50° 54.566' N, 003° 02.402' W

To obtain an xml-based SAD report click on the menu bar **Results → Saris → XML Report.** The current model will output a report to the selected location as shown below:-

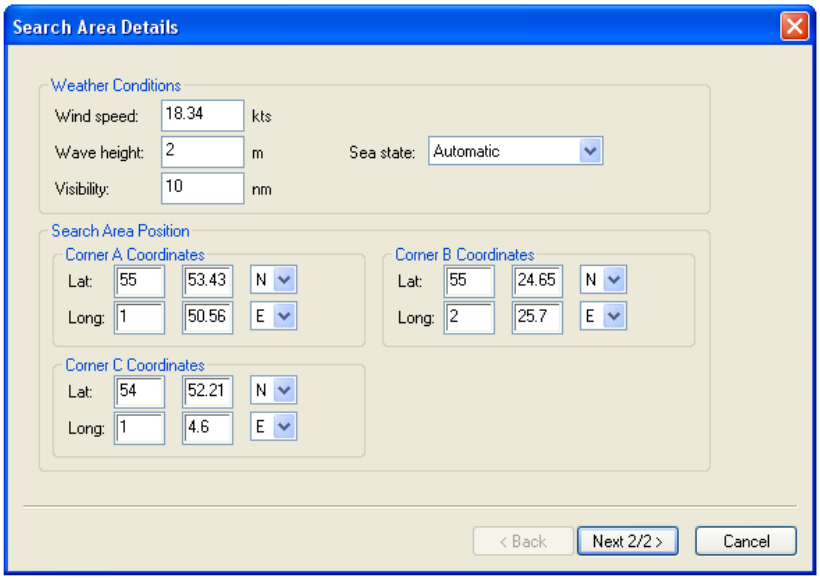


4.6 PROCEEDING TO SAC MODEL FOLLOWING A SAD MODEL RUN

SARIS allows the user to proceed directly to the SAC model set-up following completion of a SAD model run. To start the SAC model set-up click on the "Proceed to SAC phase" icon on the SAR toolbar shown below:

Select the search area required and click once over the highlighted search area. The **SAC Model** set-up will automatically start.

4.6.1 Step 1 of 2: Search Area Details

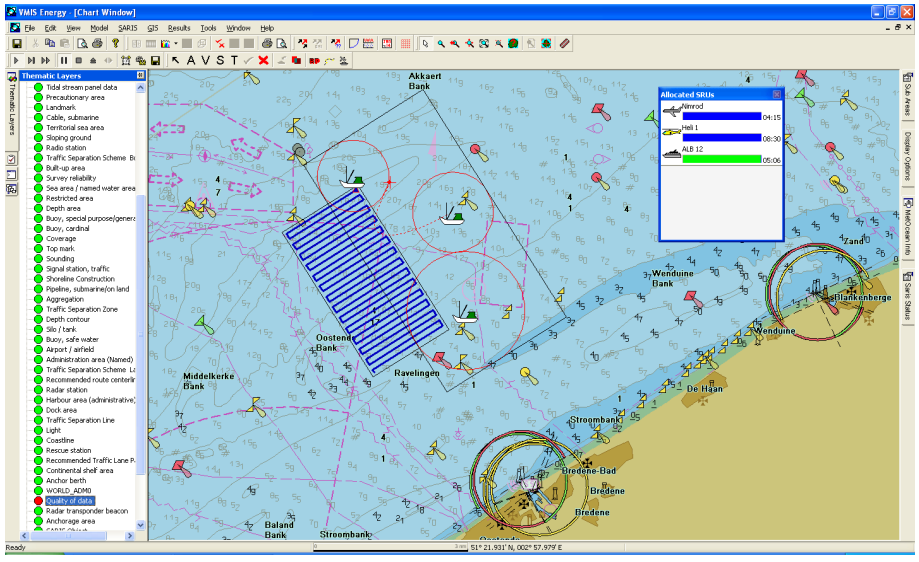


The creation of the SAC model is identical to that described in Section 3.7.2 except for the wind speed input.

Wind Speed. The wind speed is entered automatically, and is taken from data input earlier during the SAD model. The wind speed will be that which was entered into the SAD model **Weather Setup** dialogue in the six hour wind block which incorporated the Datum time.

The remainder of the SAC model is configured in the same was as that described in Sections 3.7.2 and 3.7.3 above.

When all the SAC dialogue boxes have been configured correctly, click on the **Finish** button. All available SRUs will be shown in the **Allocated SRUs** status pane as icons.



5. RUNNING A SAC MODEL

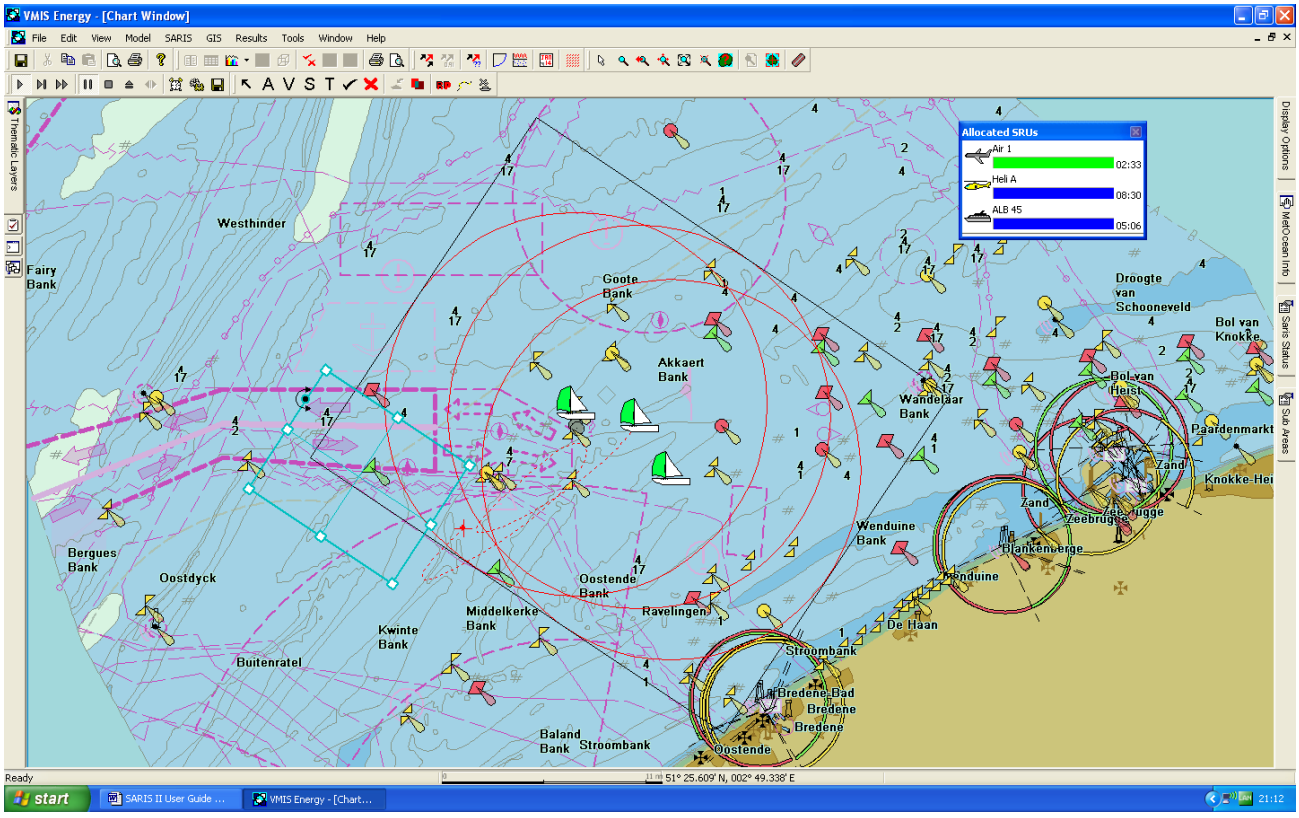
To run a SAC model the user will have first had to either:-

- Set-up a SAD model, run it and proceed to the SAC set-up
- Set-up a SAC model only

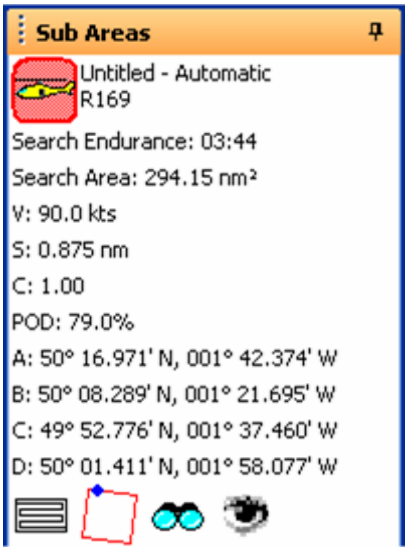
In addition, at least one SRU needs to have been configured.

5.1 DEPLOYING AN SRU TO THE SEARCH AREA

To start the SAC model, the available SRUs must be deployed in the search area. This is achieved by dragging the icon of the SRU from the **Allocated SRUs** status pane and dropping it in the search area. An example is shown below:



SARIS automatically generates the SRU sub area based upon the configured unit achieving a default Coverage Factor of 1 (POD = 79%). It is shown above as a blue box with white squares at each corner. All relevant information relating to the sub area is displayed in the **Sub Area** status pane (right hand side). An example of the Sub Area status pane is shown below:



Context Menu. Right click on an SRU icon in the **Allocated SRUs** status pane will activate the allocated SRUs **Context Menu** with the following options:

> **Edit SRU "SRU name"**: activates the Define Search Rescue Unit dialogue and permits some of the characteristics to be amended;
>
> **Add New SRU**: activates the Define Search and Rescue Unit dialogue and permits a new SRU to be defined.
>
> **Delete SRU "SRU Name"**: deletes the SRU from the model run entirely.

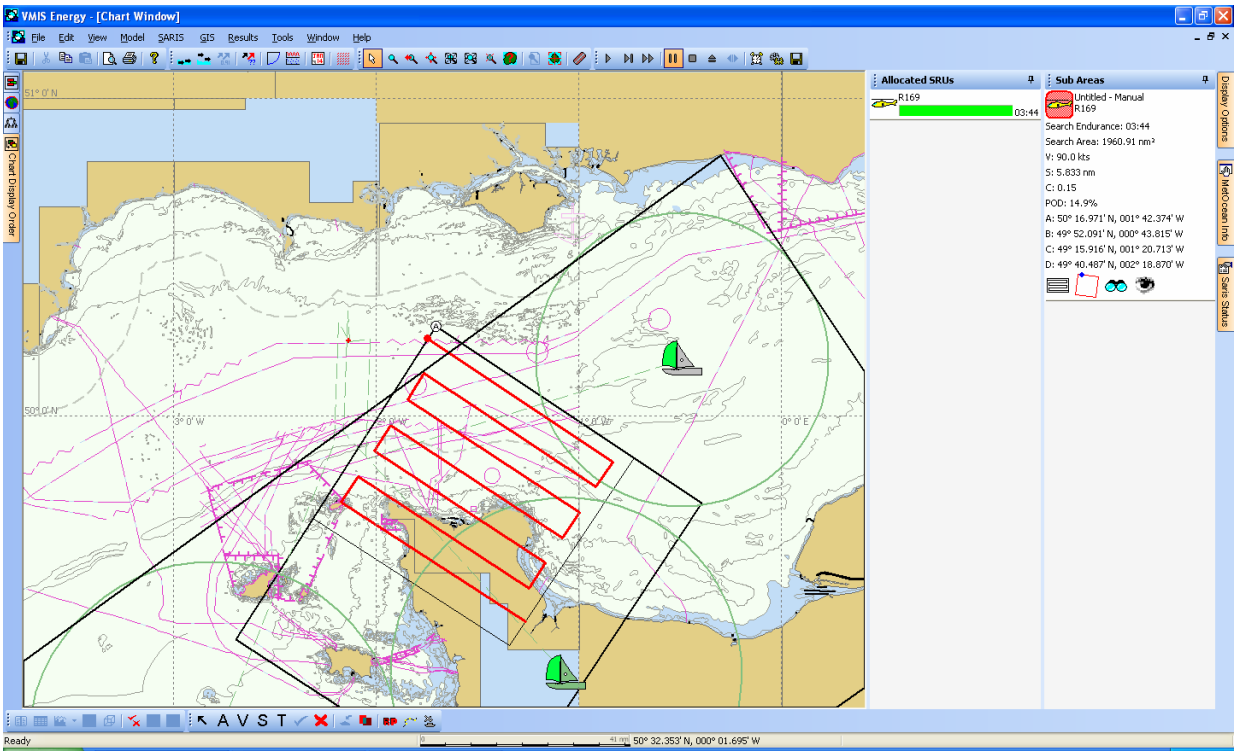
5.2 NOTES ON THE DEFAULT SUB AREA DISPLAY

SARIS 3.x assists the SAR planner in dividing up the search area into sub-areas based upon what the SRU can actually achieve given its configuration. This is different to the traditional method where the SAR planner manually divides the search area up in a subjective manner.

The default display of the sub-area on the SARIS screen is based upon the following:-

- The unit achieves a POD of 79% and/or Coverage Factor of 1
- The sub-area is orientated in the same direction as the search area
- These can be changed at any time using the manipulation tools detailed later in this section.

Notice as the blue box is dragged close to each corner of the search area it will automatically snap to that corner. Once the user is happy with the position of the sub area, select **Confirm** from the **Context Menu** (or click the **Confirm Changes** toolbar button) and the search tracks will be displayed. This is shown below in red.



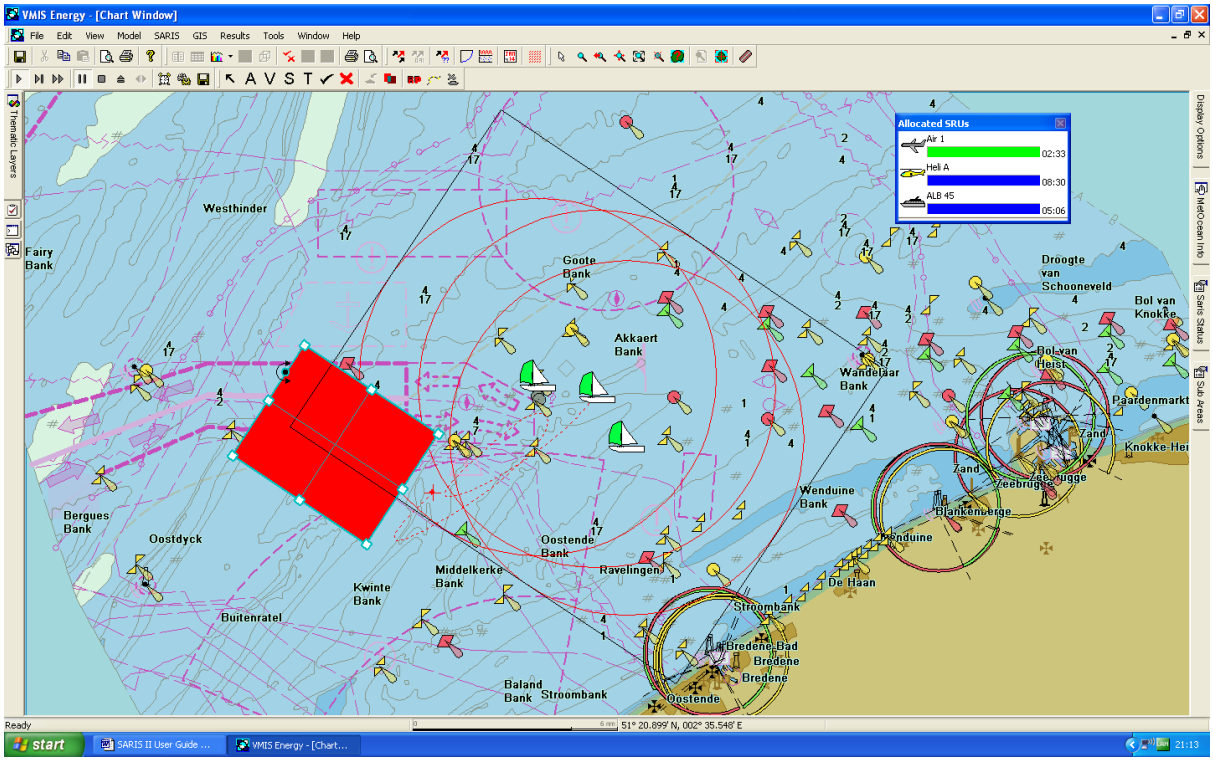
SARIS 3.x does not restrict the user to these default vales and provides a suite of tools that may be used to manipulate the sub-area in many ways. These are covered in the following section.

5.3 MANIPULATING SUB-AREAS

There are two ways to access the manipulation tool suite:-

- Via the SAR tool bar by clicking on the black arrow icon
- Right mouse clicking on the chart and selecting **SARIS → Manipulate Sub Area.**

The mouse cursor will turn to a double crossed arrow and when clicked over the sub-area may be moved to any place on the chart. The screen shot below shows an example of moving the sub-area



The sub-area may be further manipulated using the following tools on the SAR tool bar:-

A

Area

V

Velocity

S

Track Spacing

T

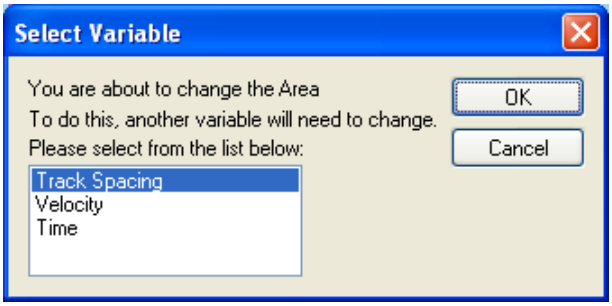
Time

The icons **AVST** relate exactly to the UK CG methodology. Note that N is missing from the equation A=VNST since SARIS only ever deals with one target at a time (N always=1).

To manipulate the sub area using these functions:-

Select the black arrow button or use the **Context Menu→ SARIS → Manipulate Sub Area.** Then select the sub-area you wish to change. Click on the

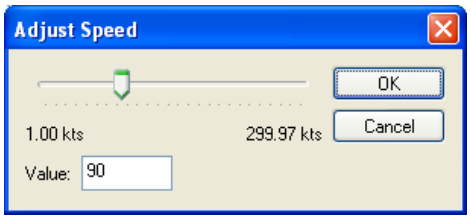
icon that relates to the parameter you wish to change (A, V, S, or T). The following dialogue box will appear (it is slightly different for each icon):-

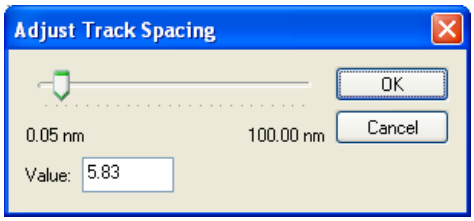


SARIS prompts the user to select another parameter that must change along with the one originally selected. In the above example, the user has selected the **A** button, therefore wishing to change the sub-area size, and then track spacing. All other parameters remain constant – in this case time and velocity.

To change the sub-area, click on any corner or mid point and drag the sub-area to the required size. Right mouse click and select **Confirm**. Note as you move the area size the sub-area status pane dynamically reports all new information.

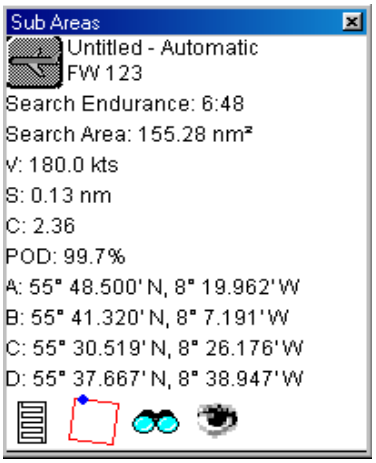
The same principle of operation applies to all other parameter combinations. The plan is manipulated by resizing the area only if that is one of the parameters chosen for change. If the *area* is not to be changed, then changing any combination of speed V, track spacing S, or time T, will open an **Adjust Track Spacing** or **Adjust Speed** dialogue box.





5.3.1 Sub area status Pane

Information about each sub area is displayed in the sub-area status pane. The following explains the possible user options:-


Sub Areas
Untitled - Automatic
FW 123
Search Endurance: 6:48
Search Area: 155.28 nm²
V: 180.0 kts
S: 0.13 nm
C: 2.36
POD: 99.7%
A: 55° 48.500' N, 8° 19.962' W
B: 55° 41.320' N, 8° 7.191' W
C: 55° 30.519' N, 8° 26.176' W
D: 55° 37.667' N, 8° 38.947' W

Icons displayed at the bottom of each sub area (left to right):-

Click on this icon to change and cycle through the various search pattern types. *(Note - a sector search cannot be selected in this manner)*

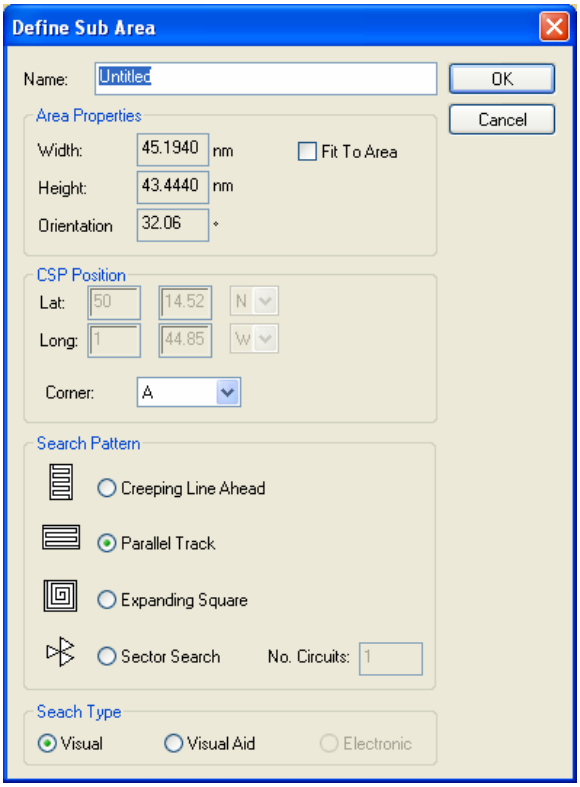
Click on this icon to change the SRU CSP (Commence Search Position)

Click on this icon to change and cycle through the search types; visual, detection aid, electronic.

Click on this icon to show/hide the sub-area.

Context Menu – right-clicking on an SRU icon in the **Sub-Area** status pane will activate the context menu, having the following two options: **Edit Search** or **Delete Search**.

Edit Search "SRU ID": This will activate the *Define Sub Area* dialogue box and give the user several options for change. *(Note – double-clicking in the Sub-Area status pane will also activate the Define Sub Area dialogue box).*



Name. This field enables the user to give the sub-area a name e.g. using the aging protocol of naming sub-areas after either S for Surface Unit or A for Air Unit, along with numerical suffixes such as S1, S2 and A1, A2 and A3.

Area Properties. The three fields; **Width**, **Height** and **Orientation** cannot be manipulated by the user and the fields are greyed out as a result. The **Fit to Area** check box can be toggled on or off. If this is activated the SRU sub-area will snap to the size, shape and orientation of the entire search area. SARIS is configured to achieve this by altering the Track Spacing value only, but of course by altering the Track Spacing, then the Coverage Factor C and POD will either rise or fall.

CSP Position. The Commence Search Position (CSP) can be manipulated by selecting the preferred sub-area corner in the **Corner** drop down menu. The co-ordinates of the CSP can be read off from this field but not altered.

Search Pattern. The Search Pattern used by the SRU can be selected from this field by checking the appropriate radio button. If a Sector Search is selected, the number of Sector Searches can be assigned (i.e. each sector search consists of nine legs).

Search Type. The Search Type can be reassigned in this field by checking the appropriate radio button.

Clicking **OK** will assign any amendments the user has made in the **Define Sub Area** dialogue box.

Delete Search "SRU ID": This allows the user to delete the defined SRU sub-area and it will disappear from the **Sub Area** status pane. The selected SRU will still be shown in the **Allocated SRUs** status pane enabling the user to re-configure a sub-area for that SRU.

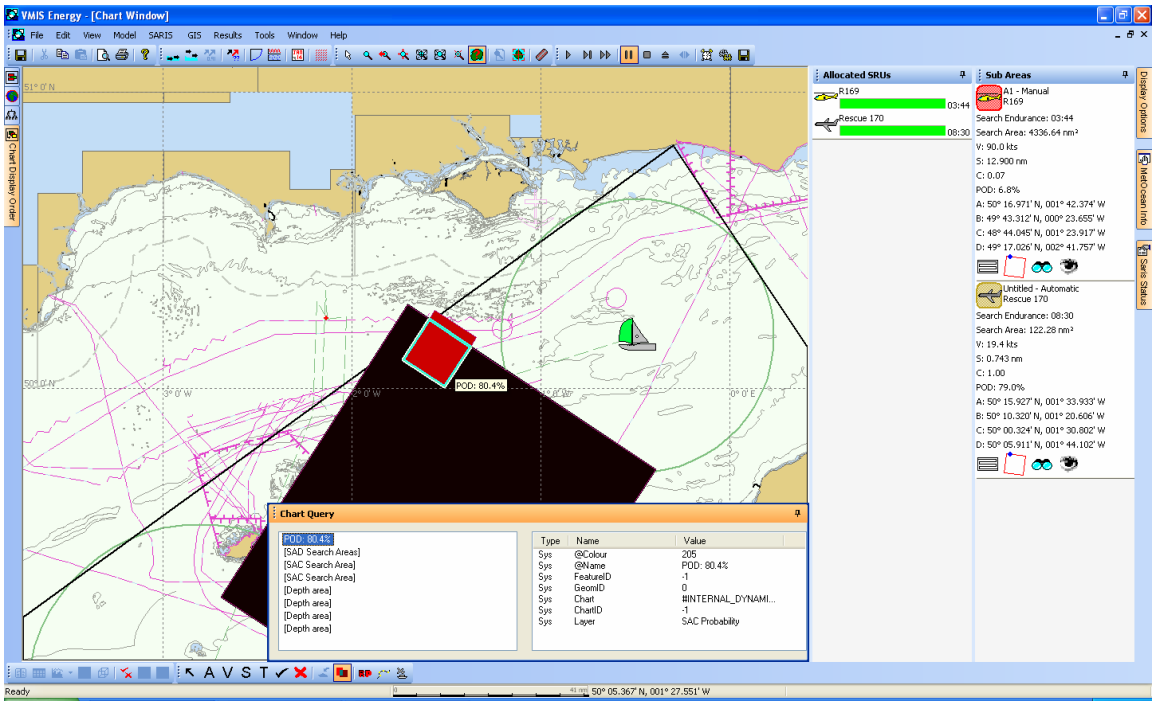
After selecting Delete Search from the Sub Area staus pane context menu, a message will appear asking "Are you sure?". Select **Yes** to delete the sub-area or **No** to cancel.

5.3.2 Calculating Cumulative Probability

During a SAR incident where two or more SRUs have been deployed, SARIS 3.x can calculate the cumulative probability of detection of the target.

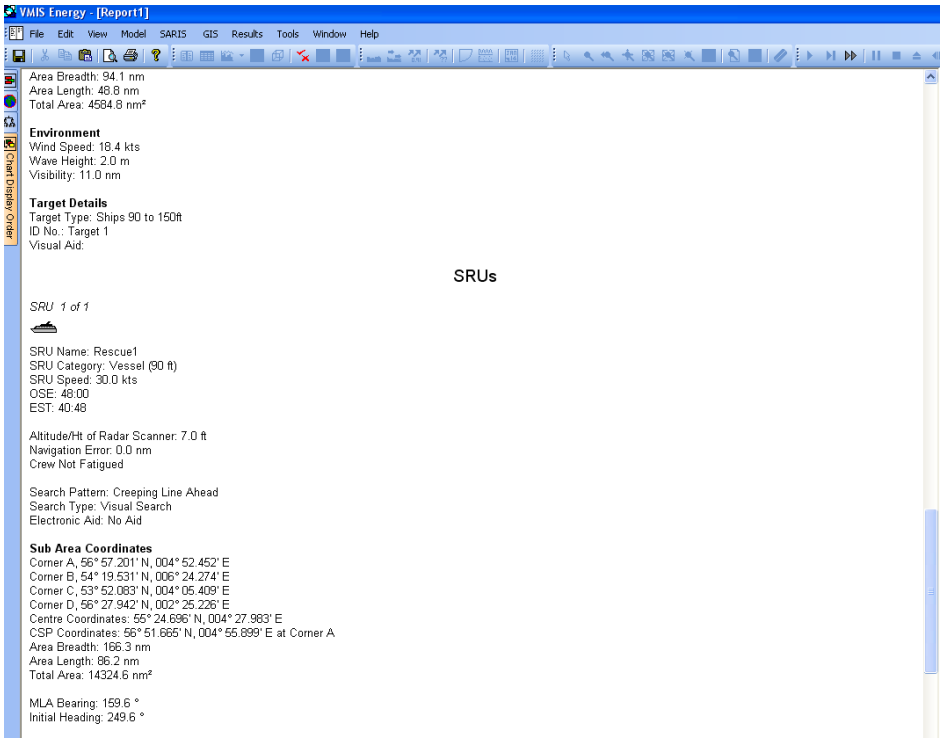
Generate Probability Overlay

Click on the Generate Probability Overlay icon on the SAR tool bar, shown above. The sub-areas will turn red and may be subsequently interrogated using the *chart window* **Context Menu → GIS → Select → GIS Query.** The probability of detection will be reported on a tool next to the cursor, as shown below:-



5.4 REPORTS – SAC MODEL RUNS

At any time during a SAC model run, SARIS can provide a text-based report or an xml report, as for the SAD model runs. To obtain a text-based SAC report click on the menu bar **Results → Report.** The current model will output a report to notepad, as shown below:-


VMIS Energy - [Report1]
File Edit View Model SARIS GIS Results Tools Window Help
Area Breadth: 94.1 nm
Area Length: 48.8 nm
Total Area: 4584.8 nm²
Environment
Wind Speed: 18.4 kts
Wave Height: 2.0 m
Visibility: 11.0 nm
Target Details
Target Type: Ships 90 to 150ft
ID No.: Target 1
Visual Aid:
SRUs
SRU 1 of 1
SRU Name: Rescue1
SRU Category: Vessel (90 ft)
SRU Speed: 30.0 kts
OSE: 48:00
EST: 40:48
Altitude/Ht of Radar Scanner: 7.0 ft
Navigation Error: 0.0 nm
Crew Not Fatigued
Search Pattern: Creeping Line Ahead
Search Type: Visual Search
Electronic Aid: No Aid
Sub Area Coordinates
Corner A, 56° 57.201' N, 004° 52.452' E
Corner B, 54° 19.531' N, 006° 24.274' E
Corner C, 53° 52.083' N, 004° 05.409' E
Corner D, 56° 27.942' N, 002° 25.226' E
Centre Coordinates: 55° 24.696' N, 004° 27.983' E
CSP Coordinates: 56° 51.665' N, 004° 55.899' E at Corner A
Area Breadth: 166.3 nm
Area Length: 86.2 nm
Total Area: 14324.6 nm²
MLA Bearing: 159.6 °
Initial Heading: 249.6 °

To obtain an xml-based SAC report click on the menu bar **Results → Saris → XML Report**. The current model will output a report to the selected location.

6. EDITING AND LOADING PREVIOUS MODEL RUNS

To edit a previously configured model, open *the Model Run Manager*, select the required file location from the drop-down menu in the top right corner of the dialogue box (see Section 3.1) and select the appropriate model type tab. Previously configured models of the selected type will be displayed in the left-hand panel of the *Model Run Manager*.

Select the model icon or name that is to be edited and either double-click the icon, or highlight it and click **Edit**. This will generate the appropriate series of the model configuration dialogue boxes, allowing the model to be edited. The previous configuration data will be displayed in each box, and it is possible to edit any of this data.

Once the configuration has been completed successfully, the program will return to the chart window, ready for the model to be run.

To load a previously configured model, without editing it, highlight the appropriate model icon or name and click **Run**. This will load the model, and return to the chart window, ready for the model to be run. The GIS display will not be updated, and you may need to **Zoom In** to the area in which the model was configured, in order to view it, or alternatively activate the **Centre on Model** and **Zoom with Model Extents** buttons (see Section 4.1).

7. ROUTE PLANNING TOOL

Accessed via the SAR tool bar, SARIS v3.x includes a route planning tool. It consists of three principle components that need to be configured by the user, these are:-

- The Route Plan
- Configuring Vessels or Aircraft
- Route Plan Query

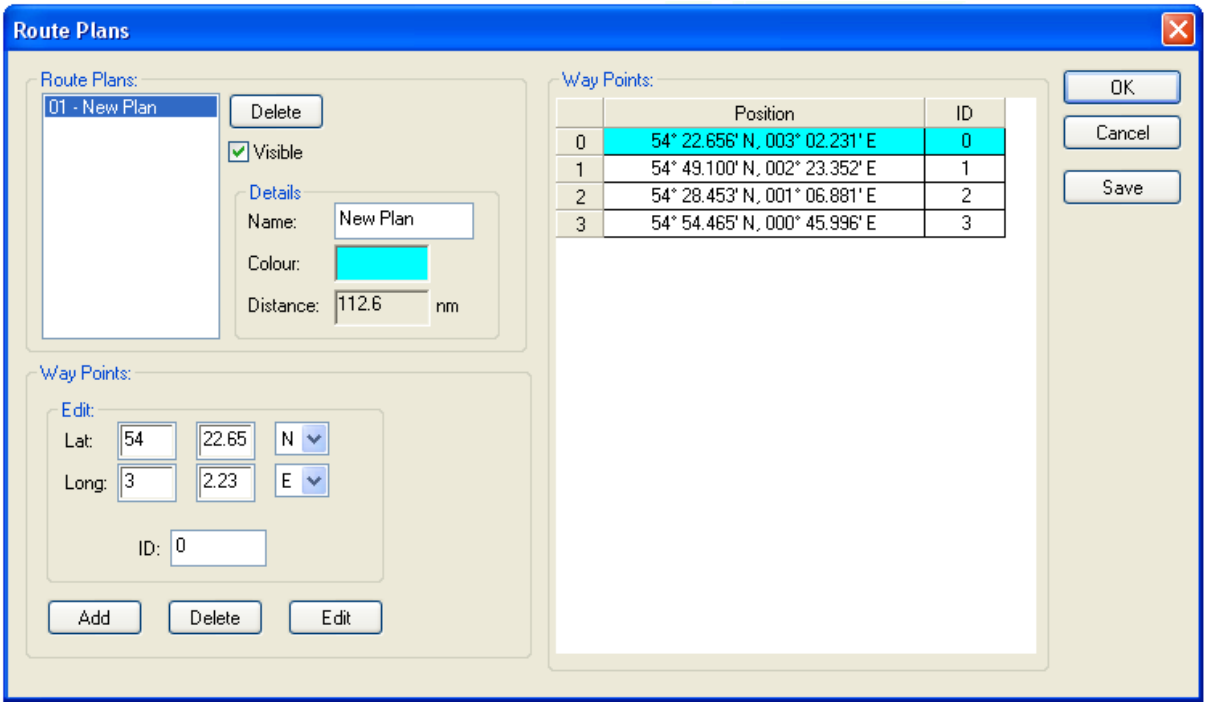
Each of these functions is located on the SAR Toolbar as shown below:-

7.1 CONFIGURING ROUTE PLANS

Firstly a route plan or plans must be defined. There are two ways that this can be achieved:-

- Drawing way points on the chart
- Manually specifying the waypoints by co-ordinates

To draw a route plan on the chart, right mouse click anywhere on the chart to open the **Context Menu** and select **SARIS→ Define Route Plan**. The mouse cursor will change to look like a pair of calipers. Left click on each waypoint required; when you have completed the route plan double click on the last waypoint. The following dialogue will be displayed:-

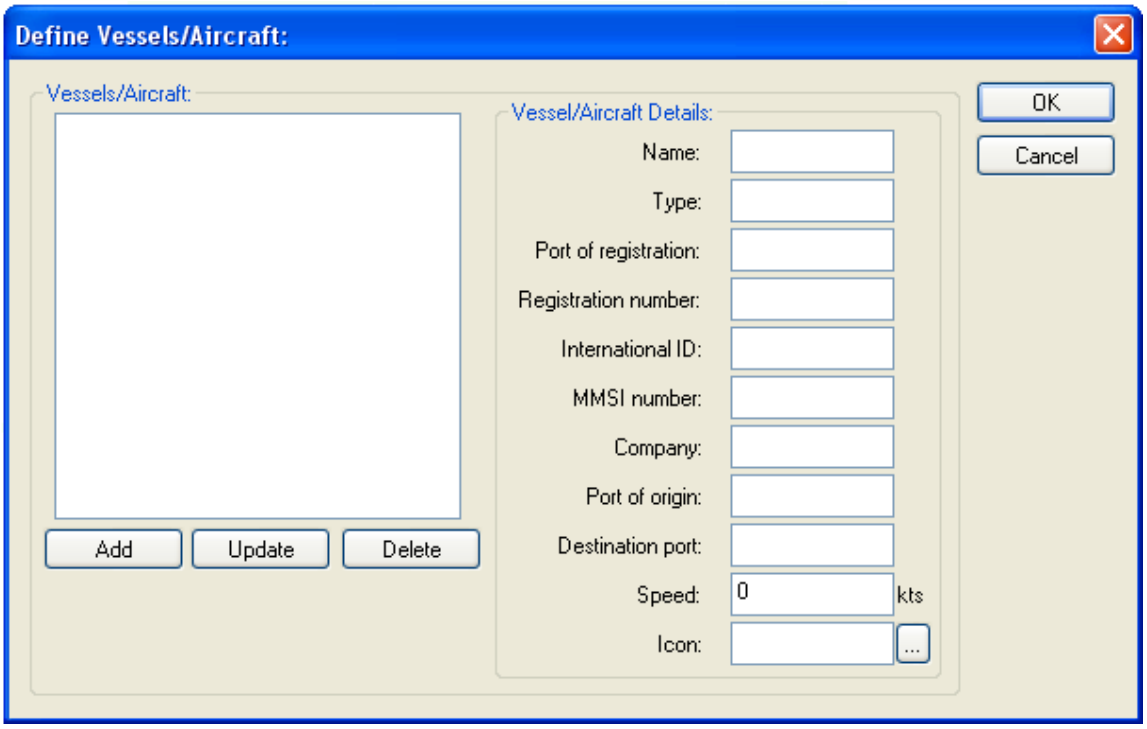


In the Name field type a unique route plan name. Waypoints may be edited using the spreadsheet at the bottom of the dialogue box. When you have finished, click on the OK button. The route plan will be displayed on the chart.

To complete a route plan by manually specifying the waypoints by co-ordinates, click on the red RP button on the SAR Toolbar. This will bring up the Route Planning dialogue box seen above. Waypoints may be added or edited as for the graphical method.

7.2 CONFIGURING VESSELS OR AIRCRAFT

The next step is to configure vessels or aircraft. Click on the icon that shows a cross above a vessel. The following dialogue box will be displayed:-



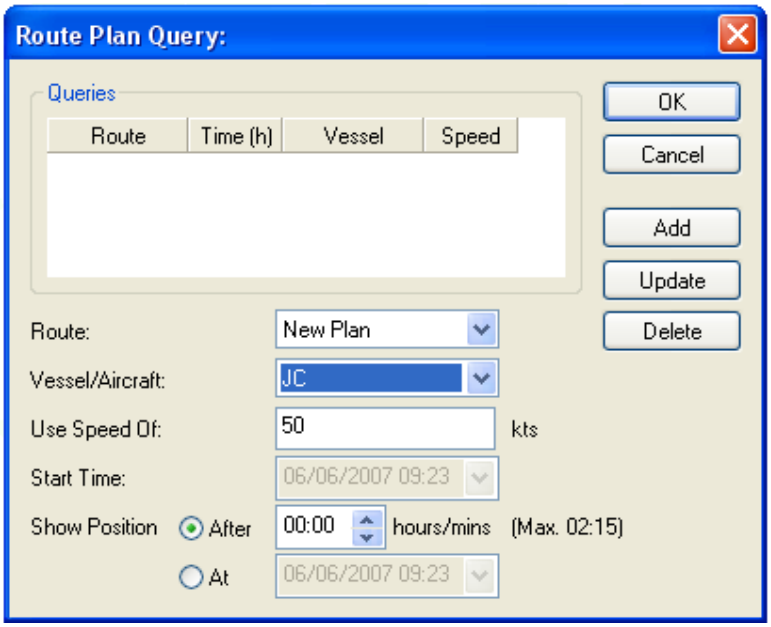
Fill out all of the required/available information in this dialogue box. Only the following are mandatory fields for the route planning tool:-

- Name
- Speed
- Icon

Once you are satisfied with the configuration click the **Add** button, the vessel/aircraft will then be added to the database. You may configure as many vessels/aircraft as you require using this method. To finish configuring vessels/aircraft click on the **OK** button.

7.3 USING THE QUERY ROUTE PLAN TOOL

Once both route plans and vessel/aircraft have been configured the route planning tool allows the user to associate vessel/aircraft with plans and display their positions along the route(s). Click on the icon that shows a black and yellow course line. The following dialogue box will be displayed:-

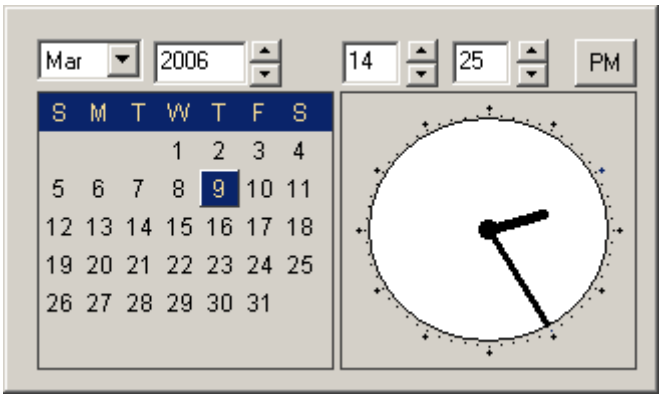


Select a route and vessel/aircraft form the drop down menu. The vessel/aircraft speed can also be configured at this point. Select a time or a date that you wish the position of the vessel/aircraft to be displayed on the route. Click the **Add** button to add the query request to the Queries spreadsheet. You may configure as many queries as you require. Once you are satisfied with the query selections click the **OK** button. The positions of the vessels will be displayed as icons on the route(s).

8. APPENDIX 1: DATE/TIME AND COLOUR SELECTION

8.1 DATE AND TIME SELECTION USING THE CALENDAR / CLOCK DIALOGUE BOX

Dates or Times can be entered in two ways; either by manually typing in the data, or by double-clicking on the Date/Time field. This will generate the *Calendar/Clock* dialogue box.



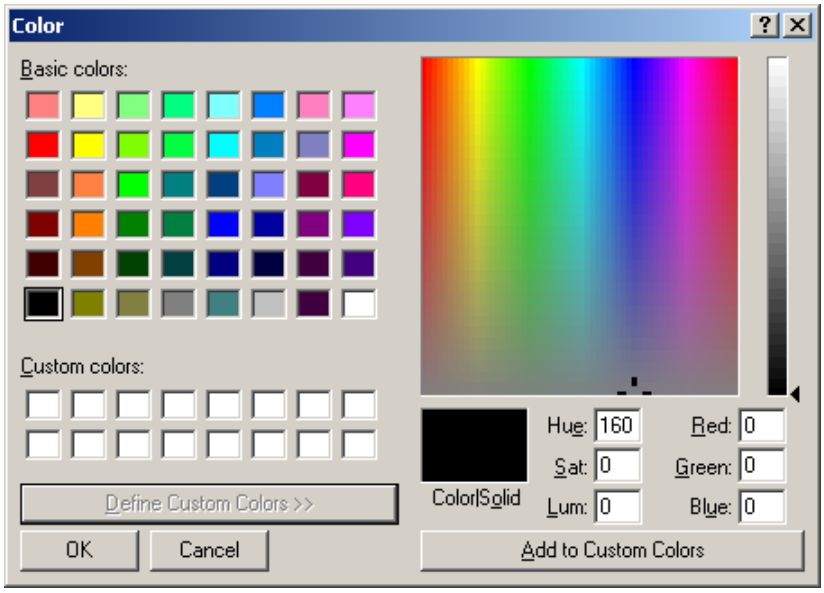
The left-hand side of the box shows the calendar, for entering the date. The month is selected from the left-most drop down list, and the year is chosen using the up and down buttons. These can also be typed in. The days of the selected month will be displayed in the bottom left-hand box, and the required day is selected by highlighting it.

The right side shows the clock, for entering the time. The hours and minutes can be selected individually using the up and down buttons, or by dragging either clock hand to the required time. These can also be typed in. Clicking the top right-hand corner button switches between AM and PM, which will also automatically update the hour (*i.e*. from 14 (PM) to 2 (AM)).

Once the date and time have been chosen correctly, clicking outside of the box will remove the calendar/clock box, and automatically enter the data into the date and time field originally clicked on.

8.2 SELECTING COLOURS VIA THE STANDARD WINDOWS COLOUR PALETTE

Colours for contours and graphs are selected via the standard Windows Colour Palette. Double-clicking in any colour field within a set-up dialog box will generate the Colour Palette dialog box.



Clicking on one of the *Basic Colours* and then clicking **OK** will select the colour, and apply it to the chosen colour field.

If a colour is required that is not shown in the *Basic Colour* chart, clicking on **Define Custom Colours** will allow you to define a colour by moving the cursor within the 'rainbow' on the right-hand side. The colour defined is displayed in the *Colour/Solid* box, and the corresponding values (Hue, Sat, Lum, Red, Green and Blue) will be shown in the boxes beneath.

Once the required colour has been defined, clicking **Add Custom Colours** will place the selected colour in the first free *Custom Colours* box on the left-hand side. This can then be selected for the chosen colour field by highlighting it and clicking **OK**.

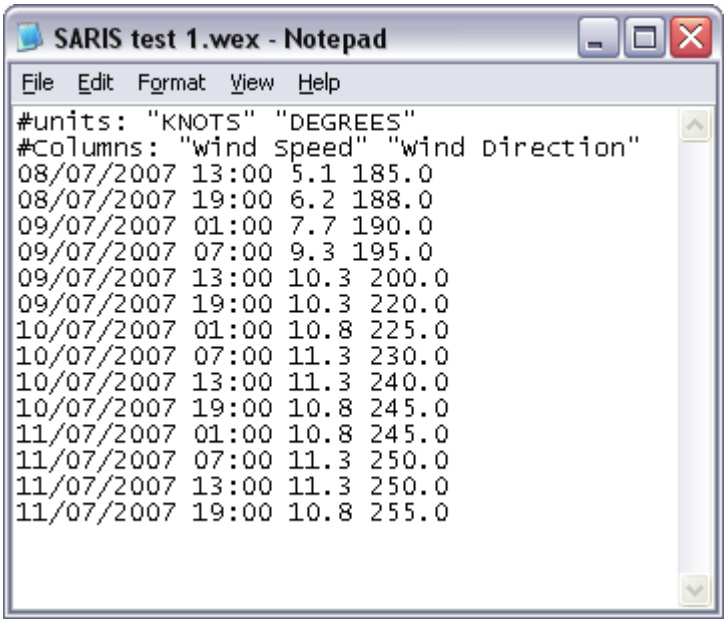
9. APPENDIX 2: IMPORTING AND EXPORTING WEATHER DATA

Files containing weather data (date, time, wind direction and speed) may be imported by SARIS for use in SARIS models. These files should have filenames with the extension *.wex*, *.txt* or *.csv*. The ASCII format for Weather Import files is as follows:

The first two rows give the column headings. The text ***#units*:** and ***#Columns**:* should be entered first, followed by the column headings in quotes, separated by spaces, i.e.:

#units: "KNOTS" "DEGREES"
#Columns: "Wind Speed" "Wind Direction"

The rows below this contain the weather data. The first column gives the date in the format dd/mm/yyyy. This is followed by a space and the time, in the format hh:mm. The data is then input in the order of the column headings above, to 1 decimal place with spaces between the values. An example of a saved *.wex* file with wind speed in knots, and wind direction in degrees, is given below:



(Note – the wind direction is given as the direction which the wind is coming from).

The *.wex* (or *.txt*) file may be exported as soon as it is configured in the Weather Setup page of the Model Plan Details setup. If the user wishes to edit the *.wex* (or *.txt*) file, this can be carried in Notepad or Wordpad. The file must be re-imported for the model run to use the updated file.

A .wex (or *.txt* or *.csv*) file may be imported into any SARIS model at the Weather Setup stage (see Section 3.3.3). The imported data will appear in the spreadsheet in the Weather Setup dialog box.